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SPONTANEOUS PNEUMOTHORAX*

BY

R. A. YOUNG, C.B.E., M.D., F.R.C.P.

SENIOR PHYSICIAN, MIDDLESEX HOSPITAL; CONSULTING PHYSICIAN, BROMPTON HOSPITAL

The escape of air into the pleural space was recognized long before Itard in 1803 applied the name of pneumothorax to this condition. Boerhaave as long ago as 1724 described a fatal case of bilateral leak of air into the pleurae due to rupture of the oesophagus. Houghton in 1832 noted the beneficial effect of spontaneous pneumothorax on some cases of pulmonary tuberculosis. The application of artificial pneumothorax to the treatment of this disease and the experience of the effects of open and closed chest wounds gained in the war have increased our knowledge of the effects of pneumothorax and led to notable advances in treatment, while the developments in *x*-ray technique have simplified the problems of diagnosis.

Until recently there have been many misconceptions about the causes of spontaneous pneumothorax and their relative frequency. The striking, almost catastrophic, results of this condition in advanced pulmonary tuberculosis, and especially when a valvular opening is formed, have dominated the clinical picture given in textbooks, and led to a preponderating role being given to this disease in its aetiology—to such an extent that in many less severe and dramatic cases latent or healed pulmonary tuberculosis has been invoked as the cause on very slender or even hypothetical evidence. It should be generally recognized that pneumothorax may occur with comparatively slight symptoms at the onset, though these may be ingravescent and progress to the more typical severity in a few hours. It is certain that incomplete spontaneous pneumothorax is often diagnosed only after *x*-ray examination, and it is therefore probable that many cases are not recognized or even suspected. It is also becoming apparent that spontaneous pneumothorax arises not infrequently in apparently healthy persons of any age in whom after careful investigation no evidence of tuberculosis or emphysema is found. The forms we are specially concerned with are those in which air enters the pleural space from some spontaneous tear in the visceral pleura, and for the purposes of this discussion we may consider:

1. Pneumothorax in the apparently healthy—pneumothorax simplex.
2. Pneumothorax in the course of pulmonary tuberculosis.
3. Pneumothorax from other causes.

Pneumothorax Simplex

This subject has attracted less attention in this country than in France, Denmark, and America. It is one which merits discussion, if only to draw attention to the facts that it is more common than is generally supposed and that it is usually of benign character.

An interesting and valuable monograph on this subject was published in English in 1932 by Hans Kjaergaard[1] of Copenhagen. He studied fifty-one patients, with a total of sixty-one attacks. He finds that pneumothorax simplex arises in patients apparently perfectly healthy without evidence of either tuberculosis or emphysema, and that they usually recover spontaneously. It is commoner in males than in females; Kjaergaard found thirty-six men to fifteen women. It can occur at any age from infancy to advanced life, though it is more frequent in early adult life—so much so that in France it is often referred to as "pneumothorax des conscrits." Kjaergaard noted that the onset was usually sudden and that strain or accident is not common. My own experience confirms this, though I have had two patients in the same family in whom it occurred while straining at stool, and one in whom it followed a fall while mountaineering. In several instances I have seen it in association with asthma, although Kjaergaard would not include these in his group if there were much evidence of emphysema. One case in a schoolboy began with sudden pain while playing tennis.

Little is known of the pathology of benign or simple pneumothorax. Many writers, chiefly on theoretical grounds, have regarded it as due to rupture of an emphysematous bulla near a small area of healed subpleural tuberculosis. It is certain that the majority of these cases show no clinical or *x*-ray signs of tuberculosis, and do not develop such afterwards. Kjaergaard, quoting Hayashi and Fischer, believes the weak point at which rupture takes place is a distended vesicle near scar tissue, with a valvular opening to a bronchiole which allows air to enter but not to escape; but he has also found rupture in distended vesicles in emphysema.

Kjaergaard's classification into five groups—partial, "coat-shaped," total with little or no displacement, total with moderate displacement, and valvular or tension pneumothorax—seems unnecessarily complicated. I suggest the following: (1) partial, where the collapse of the lung is limited by adhesions or by rapid closure of the opening in the pleura; (2) complete, when the lung retracts completely with or without mediastinal displacement; (3) valvular or tension pneumothorax, where the opening is valvular and the intrapleural pressure becomes greatly raised; (4) bilateral pneumothorax, which may be simultaneous or successive; (5) haemopneumothorax.

SYMPTOMS AND SIGNS

The symptoms in these cases vary greatly. In partial pneumothorax there may be only slight pain and shortness of breath with or without cough. These symptoms may increase and become severe if the pneumothorax progresses to complete collapse of the lung, and still more

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so if the opening is valvular, when alarming symptoms may develop, with cyanosis, restlessness, anxiety, and eventually collapse with cardiac failure, unless relief is afforded. There is as a rule no disturbance of temperature, though there may occasionally be a slight rise for a few days. Cough is not marked, and is generally short and dry. In a few cases some blood-tinged mucus may be expectorated. In haemopneumothorax the symptoms are often severe and suggestive of internal haemorrhage or of an acute abdominal catastrophe.

The physical signs may be so slight as to escape notice, or may be typical of complete pneumothorax with marked indications of mediastinal displacement. In partial cases diminished movement with tympanitic percussion note or with obliteration of cardiac or liver dullness, and weakened air-entry, should suggest the nature of the condition. Examination by *x* rays is crucial, and it is important to take oblique or lateral as well as antero-posterior views, or the condition may be overlooked in partial cases. The films also show the situation of the air and the degree of lung collapse. As a rule there is no pleural reaction and no fluid except, in a few cases, a very small pool at the costophrenic angle or at the lowest part of the pleural space.

The diagnosis of this condition has to be made from: (1) Large emphysematous bullae. In these, with *x* rays lung markings can usually be seen, and they are often multiple. (2) Subphrenic pneumothorax. *X*-ray examination will show the relation of the air to the diaphragm. (3) Congenital cysts. Diagnosis may be difficult, though the failure of the air to absorb may arouse suspicion. It is possible that some cases recorded as chronic pneumothorax may have been of this nature. (4) Hernia of the stomach through the diaphragm. This may only be differentiated with certainty by *x*-ray examination.

The course of these cases is usually benign, and the lung may expand fully in two or three weeks in partial degrees, and within six weeks in complete pneumothorax. In valvular or pressure cases the course may be longer. In a few instances the condition becomes chronic, and air may remain in the pleura for months or even years. These cases of chronic pneumothorax are probably due to the failure of the opening in the pleura to close, since removal of air under these conditions does not help. As a rule the lung expands even after many months. The liability to recurrence seems considerable, though the extent may vary in different attacks. Watson and Robertson[2] record a case with fourteen separate attacks on the two sides and on one occasion a bilateral partial collapse. Cases of bilateral pneumothorax are uncommon, and, of course, in simultaneous pneumothorax one or both are partial in patients who recover. Patients with bilateral pneumothorax may cause some anxiety, especially if one or other side has a valvular opening. They usually recover, but cases may also be recurrent.

Spontaneous haemopneumothorax is generally serious and often fatal; no lesion may be discovered; and the condition may, like pneumothorax simplex, be the result of a ruptured valve vesicle or emphysematous bulla.

TREATMENT

In partial cases no treatment is necessary save rest for a few days. In complete pneumothorax, if the opening closes, re-expansion may be rapid. It is advisable for the patient to rest in bed or in his room for two or three weeks, and the progress of absorption should, if possible, be watched by *x*-ray examination. If there are symptoms of severe pain or dyspnoea at or shortly after the onset, some analgesic remedies may be needed, and it may be desirable to take the pressure in the pleural cavity. If this is positive, air may be removed by a reversed artificial pneumothorax apparatus or, in case of urgency, by a cannula or large needle with a rubber tube attached, the distal end of which is placed under water. If the dyspnoea is recurrent, the latter may be the better method, since the cannula can be left in for some hours or days to prevent the pressure becoming positive. Some authorities advise against removal of air unless symptoms of distress arise, on the ground that the tear is more likely to heal if the lung is compressed. In cases in which absorption does not take place it has been recommended to put in air to collapse the lung further in order to favour closure of the tear in the pleura. In recurrent cases attempts have been made to produce adhesion by injecting the patient's own blood or a 30 per cent. solution of grape sugar into the pleura. In haemopneumothorax haemostatic measures may be necessary, and possibly removal of some of the blood from the pleura by aspiration.

Spontaneous Pneumothorax in Pulmonary and Pleural Tuberculosis

Spontaneous pneumothorax is certainly a common event, and often a very serious one in the course of pulmonary tuberculosis. Kingston Fowler[3] found sixty-five examples in 1,000 necropsies at the Brompton Hospital. Since it is not invariably fatal, it is clear that the incidence of this complication is more than the post-mortem figures suggest, and any sudden accession of pain, associated with dyspnoea and distress, should suggest this possibility and lead to clinical and *x*-ray investigation.

The results in this disease vary most strikingly, and we may classify the cases for purposes of discussion as follows:

1. Cases of quiescent or arrested disease leading to partial, and even complete, collapse of one lung without pleural reaction. The course is similar to that of pneumothorax simplex, from which it can only be differentiated by the most careful study, including clinical, radiological, and haematological investigation, and perhaps tuberculin tests. Patients should be treated as those with pneumothorax simplex, but should be carefully watched for a long period.

2. Cases of advanced disease. In these death occurs within a few hours or days from shock, exhaustion, or cardiac failure. It should be borne in mind that in some patients with severe symptoms soon after the onset the recognition of the valvular nature of the pneumothorax and appropriate treatment may relieve distress, prolong life, and even lead to recovery in apparently hopeless cases. The treatment is therefore to combat collapse, to relieve anoxaemia and dyspnoea, and to remove air, if there is positive pressure, by the methods already mentioned.

Between these extremes various conditions result, owing to secondary reactions of varying gravity—namely,

3. It is probable that some degree of spontaneous pneumothorax from lung rupture arises not infrequently in the course of therapeutic pneumothorax. Hutchison and Blair[4] noted this seven times in the course of treatment of 120 cases. They describe a typical temperature chart with a sudden rise and gradual staircase fall, associated with signs of mediastinal displacement and an alteration in pleural pressures. This accident seems especially apt to happen in bilateral therapeutic pneumothorax, and may lead to grave symptoms, particularly if the perforation is valvular. In treatment the pressures should be watched, with *x*-ray control, and the degree of pleural reaction carefully noted, in order to determine the spacing of subsequent refills. A valvular opening with the development of pressure may require very careful treatment and frequent or continuous removal of air.

4. The perforation of the visceral pleura may heal, but the pleura may become infected with tuberculous lesions

and an effusion of clear fluid form. Such an event may be the first indication of the presence of the disease. If, after careful examination, it is clear that the opposite lung is not extensively affected, it may be advisable to continue the pneumothorax therapeutically, treating the patient in the same way as if the fluid had appeared in the course of a therapeutic pneumothorax.

5. The perforation may heal, but definite tuberculous pus may develop, resulting in a true tuberculous pyothorax or empyema. This is a graver condition, and one in which the choice of treatment is often a responsible matter of great difficulty. The object is to secure re-expansion of the lung, though the extent of disease may be such as to render this unlikely. The most hopeful method is to aspirate and wash out at intervals with some mild antiseptic such as flavine or Carrel-Dakin solution, *x*-ray examination being used to see if re-expansion of the lung is taking place. Sometimes a phrenic block or evulsion may prove helpful. In some cases in which there is no temperature reaction with the purulent fluid in the pleura the fluid may be left, and aspirated only if it causes distress. Occasionally the lung slowly expands. Another measure which has been suggested is the so-called "disinfecting oleothorax." Ray W. Matson[5] recommends complete removal of the pus, followed by irrigation of the pleural cavity, after which a massive injection of 5 per cent. gomenolized paraffin, equal to the amount of pus removed, is introduced. If these measures fail surgical treatment should be considered, such as intercostal tube drainage with slight continuous suction, water-sealed drainage, or thoracoplasty in several stages. The decision in regard to thoracoplasty should not be too long postponed lest the patient's general condition deteriorate so much as to render it impracticable.

6. If the rupture occurs over or near a cavity the pleura may become infected with septic organisms in addition to the tubercle bacillus, and a septic pyopneumothorax result. A similar condition may obtain from the rupture of a tuberculous empyema or pyothorax into a bronchus or pulmonary cavity. This is the most serious of all forms of spontaneous pneumothorax, and may be rapidly fatal. On the other hand, it may be relatively benign in course, especially if localized. The treatment most likely to help is to aspirate and wash out unless the patient is too ill and obviously sinking, intercostal drainage as for pyothorax being employed later. If the effusion still remains septic, rib resection with water-sealed but not open drainage may be necessary, with a view to thoracoplasty later to close the pleural cavity and arrest the lung disease.

Spontaneous Pneumothorax in Non-tuberculous Conditions

Air may enter the pleura from rupture of an empyema causing a bronchial fistula, or by perforation or local destruction of the pleura by gangrene, abscess of the lung, septic infarct, or new growths of the lung, pleura, bronchi, or mediastinal structures.

It is necessary to recognize that the gas separating the pleural surfaces may arrive there by channels other than directly from the lungs and air passages—namely, (1) through the oesophagus in cases of ulceration, new growth, or trauma; (2) from the alimentary tract in cases of rupture of a subphrenic abscess or of a dysenteric or other liver abscess through the diaphragm; (3) from outside by perforating wounds or from rupture of a chest-wall abscess or of an empyema necessitatis; and (4) as a pathological rarity from its formation by gas-producing organisms in empyema.

In nearly all of these cases a septic pyopneumothorax results, often with grave symptoms at once. Physical signs may be characteristic, but *x*-ray investigation, showing a fluid level or levels in the pleura, with collapsed lung, may first reveal the condition. In many of these cases the outlook is hopeless owing to the nature of the primary condition, and palliative measures alone are practicable. In others, the treatment is surgical on the same lines as those just mentioned for infected tuberculous pyopneumothorax, though where the primary disease is abdominal special operations may be necessary.

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SUBSTANCES PROMOTING NORMAL AND ABNORMAL GROWTH*

BY

JOSEPH NEEDHAM, Sc.D.

SIR WILLIAM DUNN READER IN BIOCHEMISTRY, UNIVERSITY OF CAMBRIDGE

Among the many phrases that pass through the mind as one meditates about the remarkable phenomena which living things present to us, none has a more characteristic note than that title which Aristotle prefixed to one of the most interesting of his writings, *περὶ γενέσεως καὶ φθορᾶς*, or in Latin more ominously, *De Generatione et Corruptione*. In English this is usually translated Generation and Destruction, but there is an old phrase, more consonant with the feeling of the Greek "On Coming to Be and Passing Away." In this symposium, by good fortune, we shall be concerned entirely with certain of the agencies which are involved in the coming-to-be of living organisms, and we shall leave out of account that process of dissolution which in a few short moments can destroy what took, not a few months, but many years, to build. We shall hear something of the numerous chemical substances which in recent years have become known to us as having powerful and sometimes very specific effects upon various elements in this building process.

At the outset, however, a few words must be said about the title of the symposium. If we define growth as the increase in total weight or dry weight of a cell, a tissue, or an organ, we shall be perfectly correct but not very interesting. As soon as we acquire a close acquaintance with the processes of normal development, whereby the finished animal or human organism comes to be, we realize that normal growth is often if not generally accompanied by differentiation. We may call differentiation the sum total of all the changes by which a highly heterogeneous system of organic forms originates from the relative homogeneity of the egg or zygote. These changes produce ever higher levels of internal organization. They are perhaps more interesting than the simple growth processes, because more mysterious.

It is easier for us to picture how one cell can produce another exactly like itself, or how molecule may be added to molecule within a growing cell, than how regional changes occur. How does histological differentiation set in at the right time and place? How do organic forms arise? What exactly is going on at a moment when we can say "In a few minutes a minute depression will appear on the floor of the archenteron, and this will

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later give rise to the liver"? We cannot, therefore, separate differentiation from growth in our thought, nor ought we to consider substances affecting the latter without substances affecting the former.

A further comment also seems necessary. We are to consider "normal and abnormal growth." But what is abnormal growth? In the case, for example, of a gall produced upon a plant by some insect by the injection of a chemical substance this new growth might be said perhaps to be abnormal for the plant, but hardly so for the insect, since the very continuance of the species demands this particular parasitic habit. Or again it might be urged that at present it is normal that a certain percentage of the population in a given country should perish in old age each year from the wild growth of certain cells in their bodies, which we call cancer. But we may content ourselves by using the term "pathological" instead of "abnormal" and, having made this concession to logic, we may proceed to a rough survey of the field before us.

Stimulants of Growth

The substances which are to be considered will conveniently be grouped in a table as follows:

- Substances affecting normal and pathological growth and differentiation
  - by optimum nutrition
  - by specific stimulus
    - hormones
      - glandular
      - non-glandular
    - vitamins
    - drug-like substances

Obviously all growth and differentiation depend upon normal nutritive relationships, but studies of tissues in tissue culture outside the body have shown that certain special substances exist which produce a particularly good nutrition. In considering the stimulating substances we can therefore place these on one side. Then the specific stimulating substances themselves can be divided into hormones, vitamins, and drug-like substances causing pathological growth.

The term "hormone" is often used to cover only those chemical substances which are produced in special glands, such as the suprarenals, but it is now quite certain that it must be given a wider meaning so as to include a very large class of substances especially interesting to us—namely, all those which play a part in the many morphogenetic stimuli known to occur during embryonic development.[1] As regards the vitamins, as would naturally be expected, their absence is more important than their presence; if they are present at any time in insufficient quantity pathological growth or differentiation may follow. Finally, we know now of many substances, some of which may be naturally produced in the living body, which give a strong stimulus to the uncontrolled growth of malignant cells.

That stimulation of growth *may* be primarily connected with optimum nutrition appears from the long series of researches, first initiated by Carrel and his collaborators, upon the nature of the property of embryonic tissue juice which makes it so suitable as an ingredient of explantation media.[2] Cell multiplication and the growth of the culture is very greatly increased if a small amount of embryo extract (usually prepared from chick embryos at the seventh day of incubation) is present. The factor responsible for this was eventually identified as one or more of the intermediate split products of proteins, such as the proteoses and higher peptones. It is generally supposed that they act by providing the cells with a form of nourishment particularly easy to build up into the characteristic protein of the growing tissue, and recent hypotheses on the nature of protein structure would fit in well enough with this idea.[3]

In this connexion it is interesting that embryonic tissue is such a powerful source of supply for these protein split products, for the nitrogenous loss involved during the three weeks of the chick's development is extremely small. The suggestion may be made that the proteins of the yolk and white are not reduced to amino-acids but only to intermediate structures such as proteoses, thus passing into the embryo to be used as building material for the new organism. Investigations on the activity of the proteases during development may be expected to throw light on this interesting exchange.[4]

Glandular Hormones

We now come to the specific stimulations produced by compounds of the class of glandular hormones. The most classical of these is without doubt the effect of the hormone of the thyroid gland, thyroxine, upon amphibian metamorphosis, discovered by Gudernatsch and investigated by many workers, among whom in this country Huxley has been prominent.[5] A chemical substance produced in a special gland must of necessity await the establishment of an efficient circulatory system in development before it can travel round in the blood stream and exert its various effects. In the amphibia the circulation has by the time of metamorphosis long been well established, and so in the case of the urodeles the thyroid can suddenly pour its stores of thyroxine in the blood or, as in anurans, the concentration of it in the blood can rise progressively.

However this happens, the processes of growth and differentiation which form the fore and hind limbs are thus activated, the resorption of the tail and the gills is undertaken, and a host of other changes, such as the perforation of the operculum (in anourans) and the development of the outer ear, take place. It must not be supposed that all these changes can be put down to the direct action of thyroxine, although they all take place much earlier than they would otherwise do if thyroxine is fed to the tadpole. We know that many of them are the result of local specific stimuli,[6] analogous to the organizer action which is involved in the primary differentiation of the animal's axis.

It is likely, however, that most of these local effects are to some extent under thyroid control. The thyroxine only releases mechanisms that have previously been quiescent. Its action, in fact, is remarkably delimited by the previous structure of the body. Thus Champy[7] found that the morphogenetic effect of the thyroxine in amphibian metamorphosis depends on the pre-existence of qualitatively different regions, for under the influence of thyroxine one region of epidermis will proliferate (the limb-bud region) while an immediately adjacent region of epidermis (the gill region) will degenerate. Histologically the division between these two regions is quite clear-cut; in one section can be seen a territory of rapidly dividing cells and another territory of degenerating ones.

About the nature of the action of thyroxine on the growth and differentiation seen in metamorphosis we cannot be very definite. It is, of course, known that in mammals thyroxine considerably raises the basal metabolic rate, but has no effect upon the isolated tissue slice.[8] Thyroxine also increases the gaseous exchange and heat production of the tadpole (Schwartzbach and Uhlenhuth[53]). But the effect of such compounds as dinitro-*o*-cresol, which have in man a hyperthermizing tendency like thyroxine, and which greatly increase both the respiration and the glycolysis of tissue slices, a

amphibian metamorphosis has been tried and found to be negative.[9] Thyroxine cannot be replaced by them. And acetylthyroxine, which accelerates amphibian metamorphosis, has no hyperthermizing effect in mammals.[10]

Before leaving the subject of the glandular hormones it would be impermissible to omit mention of the relation of the sex hormones to the growth of the uterine endometrium and of the pituitary to the excessive growth of the long bones in man, leading to the well-known pituitary gigantism.

Non-glandular Hormones

Less widely familiar, and therefore perhaps somewhat more interesting, are the phenomena of organizer action, to which we must now give attention. It had long been suspected that certain groups of cells supplied " formative stimuli " to other groups of cells during embryonic development. The concept originated indeed with W. Roux himself, who used for it the term " dependent differentiation " as opposed to cases where the rudiment carries within itself all the conditions required for its differentiation (" self-differentiation "). But it remained for the experimental embryologists of this century to bring abundant proofs that such stimulatory action does occur at all stages during development, and at none in a more important way than the earliest of all, the laying down of the primary neural axis of the embryo.

How was it possible to find out whether a fragment of an embryo requires an external stimulus for its further differentiation or whether it already possesses its " marching orders "? The answer is that two techniques were necessary: first, a large amount of exact knowledge about the normal fates of each fragment of the embryo ; and secondly, the possibility of transplanting a given fragment to an unusual situation on or in another embryo, and then observing what its reaction to this new situation was. The first of these great advances was made by investigators such as Vogt, who charted out by *intra vitam* staining methods the normal destiny of each portion of the undeveloped egg or blastula.[11] The second was carried through by the grafting technique involving the use of very fine glass needles and pipettes originated by Born and brilliantly pursued by Spemann in a series of researches[12] which places him beside Roux as among the very greatest of experimental morphologists.

As we mostly know, there are two possible types of behaviour manifested by a fragment of an embryo grafted into an unusual situation, and all fragments show one or the other. It may " fall into step " with its new environment and go on to produce cells and structures congruent with that, or alternatively it may be true to its special mission and proceed on its way unaffected by the new environment. The first behaviour corresponds to dependent differentiation, the second to self-differentiation.

The first fragment is, as we say, not yet " determined " to fulfil its usual destiny ; the second is " determined." Now the formation of the main neural axis of the amphibian embryo, for instance, as we can see by observing an embryo as gastrulation concludes, is that two longitudinal ridges arise on its dorsal surface ; after forming a furrow or groove they fuse together at the edges, thus forming the neural tube, the forerunner of the spinal column. Before they have formed, the dorsal ectoderm is undetermined ; while they are forming it becomes determined for this neural fate. The extent of the determination is exactly parallel to the extent to which the dorsal ectoderm has been underlain by the invaginating mesoderm which has been entering the egg at the dorsal lip of the blastopore. And moreover, if a piece of this dorsal lip is transplanted into another embryo on the ventral side it will make the abdominal ectoderm form a neural axis in addition to the normal one which the host is itself engaged in making. This experiment, by Spemann and H. Mangold, is the cornerstone of our knowledge of organizer phenomena.[13]

It was not long before the nature of this determining influence began to be investigated. Crushing[14] and the preparation of active cell-free extracts[15] demonstrated that it was not bound up with the intact structure of the cells of the dorsal lip, and the destruction of the activity by ashing but not by boiling the tissue showed that an active organic substance was almost certainly involved.[16] Boiling, indeed, far from destroying the substance, actually liberated it in active condition in parts of the egg where it never normally appears.[17] Thus the ventral ectoderm, just mentioned, which usually quietly turns into the skin of the abdomen, will, if boiled, take on the properties of the dorsal lip of the blastopore, and will cause the formation of a new neural axis in a host embryo. This must mean that the organizer is present everywhere in the embryo, but is only liberated in active form in the dorsal lip. On the proper functioning of this piece of metabolic machinery depends the fact that we are not all Siamese twins, or worse.

Subsequent investigations on the chemical nature of this primary organizer are now still in full swing. Although no certain conclusions can yet be made, the evidence is very strong that it belongs to the class of sterols—that is to say, it is a substance containing the cyclo-pentenophenanthrene ring.[18] The significance of this will be more apparent presently.

It should be emphasized that the primary organizer which is responsible for the laying down of the original neural axis of the embryo is not the only one of these morphogenetic non-glandular hormones. Many others are known, working later on in development—for example, the induction of the lens of the eye by the action of the eye-cup upon the ectoderm, the formation of the cartilaginous auditory capsule by the ear vesicle, the induction of the tympanic membrane by the tympanic cartilage, and the relations of the Wolffian duct with the transitory and permanent kidneys. Almost nothing, however, is as yet known about the chemistry of these organizers.

Secondly it should be emphasized that, although organizer phenomena have mainly been studied in amphibia, there is no doubt that they occur also in all vertebrate development, and, in a modified form, in many invertebrates, such as the sea-urchins[19] and the insects.[20] Among the vertebrates there is no species-specificity, for a supernumerary rabbit embryo has been induced by a piece of chick primitive streak[21] ; chick and duck organizers are quite interchangeable,[22] and supernumerary newt embryos have been formed by agencies as diverse as chick embryo, tissues of rat, mouse, and man,[23] mammalian cancer tissue,[24] and amphibian regeneration blastema.[25] Strangest of all, the organizer is even present in organisms such as the coelenterates, which themselves never possess any nerve cord.[26] Clearly, the vertebrates evolved a new reaction, not a new substance.

Vitamins

From the morphogenetic non-glandular hormones we must quickly pass to the vitamins. The old distinction between stimulatory substances formed outside the body and those formed within it can no longer be helpful to us, for the chick embryo during its development synthesizes vitamin C just as it synthesizes its own thyroxine and perhaps its own organizers.[27] Vitamin D is formed in the skin by irradiation with ultra-violet light, just as insulin is formed in the pancreas. In any case, the responsibility of the plant world as the source of many vitamins was always recognized.

From the mass of literature on the effect of vitamins on growth and differentiation the well-known work on the growth of rodents initiated in the classical experiments of Hopkins will be left on one side,[28] and we will choose two or three striking instances of a more specialized kind, where lack of a certain vitamin produces far-reaching changes. In the first place, the absence of vitamin A from the diet may lead, as Golding and his colleagues showed, to a severe interference with the normal growth of the limbs in pigs. The hind limb may be represented merely by a little stringy appendage. Whether this is due to a fundamental "spoke in the wheel" of natural limb-bud formation, or whether the bud first forms normally and then atrophies, cannot be stated, since the effect has not yet been thoroughly investigated.[29] Or again, avitaminosis A during the gestation of pigs may bring about complete failure of the eye-cup to form, and hence the absence of any lens (Hale[30]).

One of the most peculiar of the effects of avitaminosis is that described by Adamstone in the chick embryo if it develops in an egg produced by a hen suffering lack of vitamin E.[31] About the end of the fourth day of incubation pathological structures arise in the extra-embryonic blastoderm, forming what is called a "lethal ring." Intensive cell proliferation in the mesoderm results in the choking of the vitelline blood vessels, so that the embryo perishes from anoxaemia and lack of nutritive materials. There is also serious bleeding into the exocoelom, usually from the atrium of the heart, at and near the rupture of which peculiar histiocytic mesenchyme cells occur. The general picture closely resembles that described by Evans and his colleagues[32] for the lethal effect of avitaminosis E on the developing rat embryo, where wild proliferation of mesoderm occurs, obliterating the placental vessels, together with weakening of the vessels and extravasation of blood.

These relationships might be expressed in the following way. In presence of vitamin E the extra-embryonic mesoderm is not "competent" (as we say in embryology) to react to the carcinogenic stimulus,* but lack of the vitamin makes it more sensitive. Similarly, adult mammalian epithelium is competent to react to carcinogens, but as the work of I. Berenblum[32] has shown, this competence can be abolished by the action of mustard gas (β-β-dichlorethyl sulphide) in subtoxic doses which, however, inhibit glycolysis, both aerobic and anaerobic. We must look forward as much to elucidating the biochemistry of reactivity as to the establishment of the chemical nature of the stimulating substances.

Drug-like Substances

This mesodermal overgrowth produced by avitaminosis E will form a convenient point from which to make the transition to the substances which stimulate such overgrowth. It will not be necessary to discuss at length the older theories of the causation of malignant growth, or to do more than make a passing reference to the notion of "embryonic cell rests," virus action, and the like, for it is much more important to describe the body of facts which point to the chemical origin of cancer than to criticize those theories which dispense with chemical factors.

In 1910, when the researches now to be described began, it had long been known that manual workers who came into contact with tar, especially when originating from gasworks, were particularly liable to suffer from cancer. The credit for demonstrating that cancer could be produced experimentally in animals by painting tar or other chemical substances on the skin is usually ascribed to Yamagiwa and Ichikawa, who in 1915 obtained cancerous growths in the ears of rabbits by long-continued applications of tar.[33] Some years earlier, however, Bayon had mixed a watery extract of gasworks tar with sterilized lanolin, and on injecting this into the rabbit's ear obtained enormous epithelial proliferation simulating cancer.[34] These experiments are now somewhat difficult to evaluate since, although Bayon demonstrated controls with lanolin alone, there is reason to believe that lanolin may sometimes contain carcinogenic substances,[35] and moreover the carcinogenic substances of tar are not themselves water-soluble. Bayon's work, however, has some historical interest.

The two Japanese investigators were soon followed by two Swiss, Bloch and Dreifuss,[36] who showed that the carcinogenic activity was due to neutral nitrogen-free substances possessing a high boiling-point. Kennaway's original work on tar was followed by spectroscopic investigations by Mayneord and Hieger, which opened the way to further advances under the aegis of Kennaway, Cook, and their collaborators. The first carcinogenic hydrocarbons prepared from tar in a pure state were described by Cook, Hewett, and Hieger, and later these were synthesized in the laboratory.[37] They all contained the tricyclic phenanthrene condensed ring system, similar to that of the long-known animal and plant sterols. The most active of these substances is 1:2 benzpyrene, but 5:6 cyclopenteno 1:2 benzanthracene is also very efficient. These produce squamous-celled carcinomata in rodents, and even metastases are not uncommon. 1:2:5:6 dibenzanthracene is less effective than the two foregoing compounds in producing carcinomata, but when injected subcutaneously in rodents it gives rise to sarcomata. One of the parent hydrocarbons of all these substances, chrysene, has been claimed as active, but this is still uncertain, and its activity cannot be very great.

The following description of chemically induced cancer is given by Murray.[38] If a mouse is painted on the back twice weekly the hair is first destroyed and the covering epithelium of the skin thickens, the lower layers showing an infiltration with lymphocytes, mast cells, and polymorph leucocytes. Then discrete warty prominences appear with the histological structure of benign papillomata. If the painting is now stopped (fifteen weeks) these warts may regress and drop off, but if the substance painted has been highly active they will now grow more and more rapidly, adhere to the deeper tissues, which will become infiltrated, and metastasize into the adjacent lymph nodes, the lungs, and sometimes into other organs.

Many other causes which produce uncontrolled cancerous growth are of course known; the secretions of some animal parasites, the application of cold, and of x-radiation, may be mentioned. But, pleas to the contrary notwithstanding, the simplest working hypothesis seems to be that these less precisely known carcinogenic agents act by liberating within the tissues substances more or less closely chemically related to the carcinogenic hydrocarbons isolated from tar. A number of interesting facts are relevant to this.

Early in the development of the subject it was found that carcinogenic substances were produced by exposing yeast and human skin to high temperatures (920° C.) with the formation of tars.[39] This showed that such substances could be formed from chemical compounds normally present in the living tissues. But later on a much more elegant demonstration of this was given by Cook, who found that it was possible, starting from a sterol compound (the bile acid, deoxycholic acid), to synthesize through various intermediate stages (12 ketocholanic acid and dehydronorcholene) a strongly active carcinogenic

* The term "carcinogenic" is here loosely used, but it is common to speak of the chemical carcinogens as producing sarcomata if injected intramuscularly, or epitheliomata if painted on the skin.

hydrocarbon, methylcholanthrene.[40] This indicates as clearly as possible that from sterols normally occurring in the body a deranged metabolism may produce specific carcinogenic substances which will stimulate certain cells to wild proliferation.

Furthermore, it has been found that the polycyclic carcinogenic hydrocarbons are oxidized photochemically in air to give water-soluble products. These products have a definite inhibitory action upon important respiratory enzymes such as lactic dehydrogenase, and, roughly speaking, the action is greater the more active the hydrocarbon is in the production of cancer.[41] This action resembles that of arsenious acid, a substance which is known to be cancer-producing, so that we may envisage a future classification of substances: (*a*) the polycyclic carcinogens themselves; (*b*) substances (or influences) which stimulate the tissues to produce their own polycyclic carcinogens; (*c*) substances of very divergent chemical composition which perhaps stimulate the cells at a point different from that affected by the polycyclic carcinogens. It has also been shown that the oxidation products of the active hydrocarbons all inhibit both respiration and glycolysis in every tissue investigated.[42] It is here that we begin to see how work on the chemical stimulating mechanism may link up with work on the metabolic peculiarities of malignant as opposed to ordinary tissue, already pushed so far[43] by the school of Warburg.

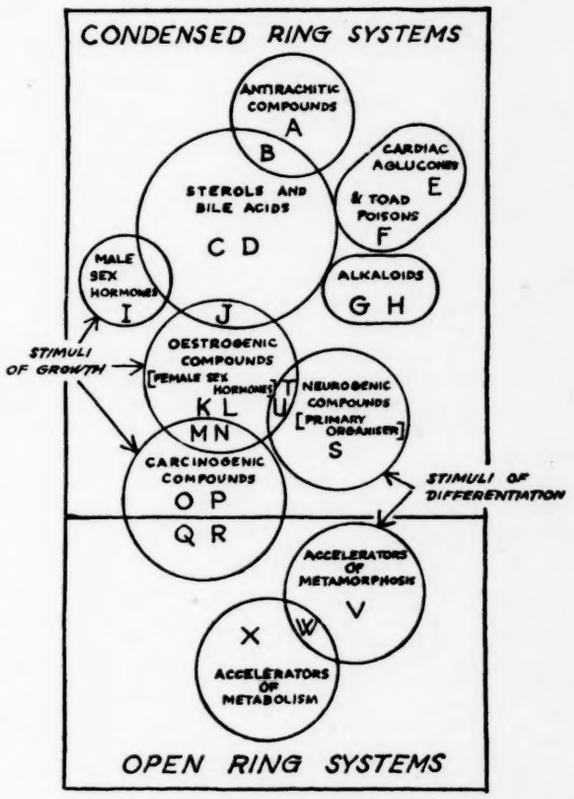
The Sex Hormones

At this point the glandular hormones which regulate the sexual cycle in the mammals come into the story. A long-continued series of researches for thirty years past has led to the conclusion that the sex cycle is controlled by two hormones or two sets of hormones. The follicular hormone, oestrone, dominates the first phase of the cycle preceding the following ovulation (growth of the vagina and of the uterine mucosa); the luteal hormone, luteosterone, dominates the second phase, permitting the formation of the placenta (including the changes prior to implantation of the egg) and ensuring the continuance of pregnancy. Largely through the work of Doisy and Butenandt, the chemical constitution of the follicular hormone was cleared up, and it was shown to belong to the group of sterols,[44] while subsequently the same elucidation overtook the luteal hormone.[45]

It now appeared that an overlap between the stimulus for cancer production and the stimuli for the sexual cycle existed. Aschheim and Hohlweg made the interesting discovery that substances are present in extracts of bituminous material such as coal and mineral oil which have considerable oestrogenic potency.[46] Obviously this might be due to substances with a similar ring structure to the naturally occurring sex hormones. In accordance with this line of thought Cook and Dodds examined a large number of synthetic hydrocarbons (the carcinogenic activity of which was known) as to their ability to produce oestrus when injected into castrated rodents, or to change the feathers in capons from the characteristic male to the female colour.[47] It was thus found that high oestrogenic potency was possessed by such bodies as 1 keto 1:2:3:4 tetrahydrophenanthrene. But some compounds are both carcinogenic and oestrogenic, such as 1:2 benzpyrene and 5:6 cyclopenteno 1:2 benzanthracene. Substances may thus be carcinogenic or oestrogenic or both. This overlap is also found on the borderline between the oestrogenic and the antirachitic substances, of which vitamin D, with its sterol structure, is the chief.

Pursuing further this chain of relationships, it has been possible to show that the ovarian hormones, interacting with hereditary factors, are responsible for the most frequent tumour of rodents, mammary carcinoma. Loeb and his collaborators were able to show that if in mice belonging to strains with a known high incidence of cancer the ovaries were extirpated at the age of 3 months the incidence of cancer fell to zero.[48] If extirpation was performed at successively later periods, the cancer incidence rose correspondingly. Seeing that the normal oestrogens of the body normally induce growth of the mammary gland, it is of great interest that, given certain hereditary predispositions, pathological growth may be induced there.

Moreover, there is a connexion between the oestrogens and the primary organizer mentioned above. Waddington and D. M. Needham[49] were successful in producing secondary neural axes in host embryos by the implantation of certain synthetic oestrogenic hydrocarbons, notably 1:9 dimethylphenanthrene and 9:10 dihydroxy 9:10 dipropyl 9:10 dihydro 1:2:5:6 dibenzanthracene. This



A, calciferol. B, β-cholic acid. C, cholesterol. D, scymnol. E, digitoxigenin. F, bufotalin. G, morphine. H, codeine. I, androsterone. J, neo-ergosterol. K, oestrone. L, luteosterone. M, 1:2 benzpyrene. N, 5:6 cyclopenteno 1:2:5:6 dibenzanthracene. O, dehydronorcholene. P, methylcholanthrene. Q, tetraphenylmethane. R, styryl-blue. S. organizer (formula not yet known). T, 1:9 dimethylphenanthrene. U, 9:10 dihydroxy 9:10 dipropyl 9:10 dihydro 1:2:5:6 dibenzanthracene. V, acetylthyroxine. W, thyroxine. X, 4:6 dinitro-*o*-cresol.

gave strong support to the opinion formed from direct investigation of the organizer's chemical properties that the primary organizer was a sterol-like substance. It also showed that an overlap existed between the oestrogenic and the "neurogenic" province. Finally, in view of the exceedingly wide distribution of the primary organizer and the presence of oestrogens in coal-tar, it is significant that oestrogens have been found to exist in some plant tissues.[50]

The association between all these growth-promoting and differentiation-promoting substances comes out in a very striking way if amphibian eggs are subjected to what is known as "delayed fertilization."[51] The longer the eggs wait for the sperm cells the more virulent is the subsequent dislocation of development. If the delay is

short, serious unbalance of the sex ratio ensues (due to interference with the formation of the sex hormones?); if the delay is longer, multiple liberation or formation of the organizer takes place, and multiple monsters result; if the delay is very long, development runs an extremely abnormal course, giving shapeless terata, and these, if implanted into an adult frog, will give malignant growth including even metastases. May we not interpret this as a series of perturbations of sterol metabolism?

It is also pertinent to inquire whether malignant growth ever occurs in young embryos at the time when organizer phenomena are in full play. The answer is still uncertain, but there are descriptions in the literature of enormous ectodermal proliferations taking the place of a properly axiated embryo, and these merit further study than they have yet received. In later foetal life, of course, malignant growths have often been recorded, but they are of less immediate interest.

In this connexion the chorio-epithelioma comes to mind. It is certainly derived from the chorionic villi, which the extra-embryonic parts of the foetus push into the maternal tissues. As is well known, this malignant material, of immediate embryonic origin, frequently metastasizes into the vagina and the lungs. But as yet we know nothing of what organizer phenomena are involved in the extra-embryonic trophoblast.

In conclusion, the overlap between the substances described in this address may be pictured by a series of overlapping domains (see diagram). In thinking of the effects of the many stimulants *in vivo* we must always remember that there is another factor in the system about which almost nothing has been said—namely, reactivity or competence. The quantitative evaluation of this factor will be one of the principal tasks of the future. In the meantime, let us savour the exhilaration which we may legitimately feel in seeing the pure crystals of so many chemical compounds, so vital to the coming-into-being of organic forms.

Explanation of Diagram

This diagram illustrates our new knowledge of biological specificity. A given biological effect can be produced at will by not one chemical substance, but by any one of a group of related chemical substances. We may therefore represent this by a circle enclosing a domain. But we also know that some of these substances will bring about other biological effects; we must therefore draw the circles so that to some extent the domains overlap. All the compounds within a domain have a closely related chemical constitution, but whereas some of them will only perform one action, others will perform more than one and will therefore belong to two domains.

Examples.—Substances K and L are oestrogenic only; O and P are cancer-producing only; but M and N both produce cancer and also affect the mammalian oestrous cycle. Similarly, S is the naturally occurring primary organizer, but compounds T and U both stimulate competent ectoderm to form a neural tube, and also act as oestrogens. Then there is an overlap between the oestrogenic domain and that of the ordinary sterols and bile acids, for compound J possesses some oestrogenic activity. Or again, vitamin D (calciferol), represented here as compound A, is a partially open-ring compound, but there is an overlap with the sterols, for compound B possesses antirachitic activity.

The lower part of the whole diagram includes substances which are chemically open-ring substances, as opposed to the condensed-ring substances which take up the greater part of the picture. It is interesting that the carcinogenic domain overlaps into this region, and here also we have the two domains connected with thyroxine, the acceleration of metamorphosis in the frog, and the acceleration of metabolic rate in mammals. The former of these is of special interest, since, like the organizer phenomena, it is concerned with the factors involved in differentiation, not growth. The chemical formulae for the twenty-four substances mentioned will be found in reference 8 and similar reviews.

As yet we know almost nothing of the way in which these various substances can be transformed into one another in the body. But the close chemical relation of so many different active substances, and the fact that some of them can perform more than one biological action, makes it very probable that such transformations do go on in the body. Instances have also been given in the text which show a biological juxtaposition of phenomena, suspicious in view of what we know of the chemical relatedness of the active substances probably responsible.

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POLYAVITAMINOSIS AND ASULPHUROSIS

BY

E. JENNER WRIGHT, M.R.C.S., L.R.C.P., D.T.M.

H. Strachan (1897) described some cases he considered to be an unrecorded form of neuritis. The first external signs noticed were often redness and irritation of the eyelids and lips, which soon passed into a slightly eczematous condition at the corners of the mouth. Sometimes there was a similar condition in the muco-cutaneous line in the prepuce; more rarely there was the same condition of the vulva and anus. There might be much loss of surface epithelium on the tongue, and dimness of vision was a cause of frequent complaint. H. H. Scott (1918) referred to these cases in his work on an acute outbreak of central neuritis in Jamaica, expressing the opinion that the elucidation of the cause of the former disease would clear up the mystery of the central neuritis.

E. Jenner Wright (1927) described a syndrome which he attributed to a deficiency of vitamins A and B in the diet. At that time, as H. S. Stannus (1930) remarks, he did not distinguish in vitamin B the two factors, anti-neuritic B_1 and anti-pellagra B_2, as demonstrated by Goldberger (1926). However, in an article in a later publication (*Dietetics in Warm Climates*, 1930) the two recognized factors of the vitamin B complex were given consideration, and attention was drawn to the evidence showing that the lesions due to a B_2 deficiency tended to ulcerate whereas the A avitaminosis lesion did not ulcerate but was degenerative with keratinization. It is nevertheless interesting to note that J. L. Rosedale (1935) wrote: " The scientific outlook of vitamin B has changed considerably, although it does not yet seem possible or necessary to differentiate the parts of the complex in practical human dietetics."

Clinical Characteristics

The A and B avitaminosis disease was described as being distinct from pellagra and beri-beri, characterized by lesions of the mucous membranes and skin, especially evident at the muco-cutaneous junctions, associated with or followed by disorders of the nervous system, and curable by the addition of cod-liver oil and yeast to the diet. The early symptoms are glazing of the tongue from loss of filiform papillae with soreness and smarting. The angles of the mouth become sore, the anus, scrotum, or vulva eczematous, the skin often rough and showing a keratosis especially evident on the extensor surface of the forearm nearer the elbow than the wrist, and of the thigh nearer the knee than the hip. The tongue is tremulous. External eye symptoms are shown by a glazed, varnished appearance of the skin at the canthi, irritable and inflamed conjunctiva, and sometimes lachrymation. In other cases the ocular conjunctiva is anaesthetic, and in this connexion it should be noted that R. H. Elliot (1920) refers to decreased sensibility of the cornea and conjunctiva, and also to retrobulbar neuritis, as eye symptoms of beri-beri.

The appearance of the face and tongue are well illustrated in Leitch's *Dietetics in Warm Climates* (1930), and the excellent photographs of monilia dermatitis, as it involves the scrotal region, illustrating a paper on dermal moniliases among natives of West Africa by E. C. Smith (1930), give an exact pictorial representation of the scrotum in the A and B avitaminosis disease. It is interesting to note that Smith, in his histological findings in moniliasis, states that " hyperkeratosis and parakeratosis are constant findings, and usually dominate the microscopical picture."

J. M. H. MacLeod (1930) notes, when referring to a condition generally known as " perlèche," which is indistinguishable microscopically from the mouth lesion described in the A and B avitaminosis disease, that the organism found in the lesion is a monilia which may be pathogenic or not. The mucosal and skin affections are considered due to vitamin A deficiency, while tremor of the tongue is regarded as the first evidence of nervous symptoms. There follows a train of symptoms implicating the nervous system—namely, alteration in the knee-jerks, often with asymmetrical reactions, sensations of heat, cold, or of " pins and needles " in the extremities, and dimness of vision shown as day-blindness. There is also increasing difficulty in walking and in using the upper extremities. Epigastric discomfort is a cause of constant complaint.

Synergism of Vitamins A and B

H. S. Stannus (1934), in a letter to the *Lancet*, writes: " Mellanby believes pellagra to be due essentially to a vitamin A deficiency. He [Mellanby] thinks that the nervous lesions found in his experimental animals fed on a vitamin A deficient diet are comparable to those in pellagra, and further holds that the pellagrous eruption is due to the same deficiency; he says ' the pellagrous skin lesions are clearly due to loss of a neurotrophic control.' To meet the objection of those who have followed Goldberger, he suggested that vitamin A may be rendered ineffective ' in the absence of some other nutritional factor such as vitamin B_2.' " These remarks are of particular interest in the light of the clinical results given in this paper, which go to show that vitamins A and B work synergically, and may be ineffective in the absence of sulphur, which is shown to be another nutritional factor.

Patients with the disease not too advanced recover on the administration of cod-liver oil and marmite; but in neglected cases with marked paresis months may elapse before they recover sufficiently to walk about. The failure of vision, which is a common symptom, especially in school children and pregnant women, responds readily to treatment if started in time. It should be recorded that the fat-soluble vitamin concentrates, radiostoleum and advita, are efficient substitutes for cod-liver oil; essogen, which is vitamin A without D, has not proved quite so effective. There is experimental evidence which shows that ultra-violet irradiation causes an increase in the sulphur content of the blood. Unfermented palm juice is a useful substitute for yeast.

During many years of observation and treatment of these cases it has become abundantly evident that the most rapid cures with vitamin therapy alone are obtained when vitamin B is used in conjunction with vitamin A. M. McDowall (1930), writing of the A and B avitaminosis disease, states: " Mild cases respond to prolonged treatment with large doses of cod-liver oil; the most rapid cures are effected with cod-liver oil and fresh unfermented palm juice." Palm juice is a rich source of vitamin B even when unfermented. This is important because it has been suggested that the large sulphur content of yeast is responsible for the curative properties of yeast in pellagra.

At this juncture the observation of G. W. Bray (1928), on the synergic action of vitamin A and vitamin B, may be recalled. He reports: " Vitamin A is the chemical impulse which hastens or regulates growth. In its presence cellular multiplication takes place, and in supplying the necessary impulse it is itself oxidized. Vitamin B is the chemical impulse regulating function; it hastens the rate of renewal of energy, and thus enables the cell to fulfil its offices efficiently. In favour of the synergic action of the growth-promoting and function-fulfilling vitamins, there is abundant evidence both experimental and practical." In the experimental evidence Bray draws attention to the ability of vitamin B to counteract the bad effects of an excess or deficiency of vitamin A, inasmuch as the addition

of B allows the absorption and utilization of A, and furthermore permits the utilization of any reserves of A that may have been on hand when B ran out.

Since the description of the symptom-complex under the designation A and B avitaminosis disease, a good deal of attention has been focused on it, and it has been reported as prevalent in various parts of the world. In the Seychelles, by J. T. Bradley (1928) a disease called "decoquée" was described as being prevalent on the outlying islands, corresponding closely with the Sierra Leone disease.

In Nigeria, Moore (1934) described the epithelial lesions of the same syndrome, while paying particular attention to the defective vision which he attributed to retrobulbar neuritis. He does not describe any of the other recorded nervous manifestations, but considers that the syndrome offers for research a means of linking together other deficiency diseases, such as pellagra and beri-beri. This suggestion is of particular interest in view of the fact that one of the eye symptoms of beri-beri is retrobulbar neuritis.

R. H. Elliot (1920) states that in 1895 Kono published six cases of beri-beri, associated with amblyopia, central scotoma, and contraction of the visual field, but presenting no fundus changes. Three years later Komoto discovered that the cause of the amblyopia and of the central scotoma was to be sought in a retrobulbar neuritis. Yamamoto seems to have been the first (1903) to draw attention to an atrophic condition of the temporal disk in these cases. Kagoshima, in 1918, made an anatomical examination of five cases in which beri-beri scotoma was present; he found in all of them a distinct and limited atrophy of the fibres in the outer section of the optic nerve.

Localization of Early Lesions

Attention should now be drawn to the distribution of the epithelial lesions which are the earliest evidence of the disease—that is, on the tongue, lips, angles of the mouth, scrotum or vulva, and conjunctiva. The significant fact emerges that these are the areas richest in certain special cutaneous sense organs, called end-bulbs, which are also found in the sheaths of nerve trunks, synovial membranes, and intestinal mucosa. These end-bulbs are sense organules, composed of modified epithelial cells, in which the delicate terminations of the nerve filaments end.

While considering the distribution of these early lesions, the very common early symptom of failure or dimness of vision—a loss of central acuity of vision—may be discussed. The failure of vision—day-blindness as opposed to night-blindness—is characterized by being most marked in bright light, very little inconvenience being noted at dusk or night time. The rods and cones are the sense organules of the retina and are of epithelial origin. It is generally conceded that the cones are concerned with visual acuity in bright light, and that they are found to be the only element at the centre of the retina—no rods being present—but as the periphery is reached the proportion of rods to cones steadily increases until very few cones are found.

The rods, which are associated with the presence of visual purple, are situated in the regions of the retina, which react to light of low intensity—that is to say, they are concerned with night-blindness. The cones are longer and more highly developed than the rods. They would appear to be the special epithelial sense organule of the retina to suffer in the syndrome of A and B avitaminosis, just as it is possible that the end-bulbs are the special epithelial sense organules to suffer first among the sense organs in the skin and mucous membranes.

The sense of hearing is certainly often affected, but, so far, in cases investigated for loss or alteration in the sense of smell and taste, no impairment has been detected. It must be recorded, however, that the results of subjective examination in the patients under consideration are not so reliable as they would be if obtained from more educated people.

The non-impairment of the sense of smell may be accounted for by the first cranial nerve differing from all the other sensory nerves in having its nerve endings in direct contact with the air. The apparent non-involvement of the sense of taste may be explained by the origin of the epithelial constituents of the taste buds differing from that of all the other special receptors—the epithelial elements in the taste buds are derived from entoderm whereas all the others are from ectoderm.

All the early symptoms of the disease then are traced primarily to a disturbance in areas containing certain epithelial elements which probably depend on both vitamins A and B for their integrity, efficient working, and functioning. Just as the multiple neuritic lesions are always secondary to the epithelial lesions, it seems reasonable to assume that the evidence of neuritis of the optic nerve, sometimes observed in the disease, is secondary to the retinal lesion in which the cones are involved. Using an Emesay reflexless ophthalmoscope, I have recently examined a large number of cases of defective vision, but I have not found any observable pathological changes in the optic disks in the majority of fairly recent cases associated with epithelial lesions of the disease.

In view of the synergic action of vitamins A and B, coupled with the knowledge that a deficiency of a vitamin in the body may cause a different syndrome under different conditions, there would not appear to be any objection to the acceptance of a vitamin A deficiency in this disease merely on the grounds of the apparent absence of night-blindness from the syndrome. Furthermore, the work of A. Jores (1933), "Concerning the Function of the Pigment Hormone in the Human Organism," shows that the form of pigment hormone known as the melanophore hormone takes part in pigmentations of human beings. In this work it was shown that the melanophore hormone has an influence on the dark adaptation of the human eye. There was an acceleration of about twenty minutes in the adaptation speed when the hormone was dropped into the eye of a person with normal sight. Thus it was shown that the hormone was involved in the formation of visual purple. Intravenous injection also caused acceleration of the speed of dark adaptation, showing that the hormone is probably carried by the blood stream.

It seems reasonable to assume the possibility of the deeply pigmented negro race being naturally endowed with an ability to produce better supplies of the melanophore hormone than the fairer races; there would be, consequently, a decreased liability to night-blindness in the presence of certain degrees of A avitaminosis which would cause night-blindness in persons not so endowed. In Ceylon, L. Nicholls (1934) describes the same deficiency disease and considers it due to vitamin A deficiency only; the Editor of the *Indian Medical Gazette*, however, indicates in a footnote to the paper that there is a vitamin B deficiency in the dietary of the people under discussion.

Therapeutic Experiments

In Malay, Landor and Pallister (1935) describe the syndrome, but ascribe it to a B_2 deficiency. It is significant, in view of what has been written concerning the synergic action of vitamins A and B, that these observers did not intentionally administer the two vitamins together in their experiments in the treatment of the disease. In one experiment they first gave cod-liver oil (2 oz. daily) for four weeks and found no improvement. They then gave the same patients the equivalent of 1 oz. of orange juice daily for three weeks with no improvement, some of the

patients getting worse. They finally gave the same ten patients ½ oz. of marmite daily, when they began to improve rapidly, most of them becoming nearly well in two weeks. Nine of the ten were completely cured after twenty-six days of marmite. No allowance or provision was made in this experiment for the capacity of the body to store vitamin A.

Another ten patients were placed on a daily dose of 4 oz. of yeast—which was estimated to contain 18 grams of dried yeast—considerably more yeast than was given in their previous experiment when ½ oz. of marmite was allowed daily. Nevertheless, the result was not so good, the probable explanation being the absence of the preliminary dosing with vitamin A. In a third experiment, when ½ lb. of liver was given daily, they got most rapid cures. They stated that the immediate improvement with liver was greater than with yeast or marmite; this is as would be expected, for they were giving a rich source of both vitamins A and B.

It should here be observed that no note of a vitamin A concentrate being used in these experiments is recorded. In Sierra Leone we have found sometimes that cod-liver oil does not appear potent and at other times cannot be absorbed. In these cases the vitamin A concentrate should be used by the parenteral route before deciding against its efficacy in disease.

Concluding this introductory portion, in view of the efficacy of sulphur in the cure of the syndrome, as will be shown presently, it should be recalled that there is evidence that the A and B avitaminosis disease can be cured by the administration of vitamin B in the form of fresh palm juice and vitamin A as a concentrate. Consequently, their deficiency must remain an important aetiological factor in the disease, especially in view of the frequent precipitation of the disease by pregnancy. Although this condition possibly causes desulphurosis, it undoubtedly causes devitaminosis, and consequently originates a conditioned deficiency—that is, one in which the intake of vitamins proves insufficient because of some abnormal condition in the body.

Finally, in view of the ready precipitation of the A and B avitaminosis disease by pregnancy, or by an excess of carbohydrate in the diet, it is interesting to recall that the pituitary hypertrophies during pregnancy. Two of its hormones, pitocin and pitressin, contain sulphur in their molecule, and insulin is a rich sulphur-containing substance.

Disease Caused by Excess Cereal in the Diet

The Freetown Gaol is a relatively up-to-date building of concrete, with a population of between 200 and 250 African prisoners, and provided with a kitchen in which all the cooking is done by steam. The dietary of the prisoners is as follows, on alternate days.

First Day:

Morning.—Rice, 12 oz.; raw fish, 2 oz.; greens, 3 oz.; salt, 1/4 oz.; palm oil, 1 oz.; beef or mutton, 1 oz., minced.
Evening.—Rice, 10 oz.; minced meat, 1 oz.; greens, 3 oz.; salt, 1/4 oz.; palm oil, 1 oz.; pepper, 1/20 oz.; kaindah, 1/40 oz.; onions, 1/4 oz.; limes.

Second Day:

Morning.—Foo-foo, 1 lb.; minced meat, greens, salt, palm oil, pepper, kaindah, and onions (weights as above).
Evening.—Rice, 10 oz.; two-thirds of a dried bonga; greens, salt, palm oil, pepper, onions, limes, kaindah (weights as above).

Cocoa, 1/2 oz., sugar, 1/2 oz., daily before morning work.
Fruit, twice a week.

A large number of prisoners on admission to the gaol show evidence of the epithelial and mucous membrane lesions of the A and B avitaminosis disease, and it has been observed that in most cases the prison diet effects a cure of these lesions, but not so rapidly as when vitamin therapy is instituted.

The prison bakery, which was established to supply outside Government institutions, is staffed by long-sentence men. These men, when drafted to the bakery, do not show any evidence of the disease, but after some time there they are noticed to develop the epithelial lesions; whereas men in all the other branches—namely, tailoring, sail-making, rice mill, stone sheds, etc.—as a rule remain free when once well. It is very significant that all the men in the bakery should show evidence of the disease, whereas it is hardly to be found among the rest of the gaol population. The only explanation of this fact is that the bakers are allowed ½ lb. of bread a day—they certainly eat much more—in addition to their usual diet. It is presumed that this extra carbohydrate intake is sufficient to unbalance the diet and precipitate the disease.

For a period there were five bakers under observation; when it was decided to treat them they were left under the same dietetic conditions which, it is presumed, caused the disease to develop, and their condition was as follows:—

Patient	Tongue	Angles of mouth	Scrotum
No. 1 ..	Shiny	Slightly altered	Typical powdery condition
No. 2...	Shiny and tremulous	Altered	Well marked
No. 3...	Slightly shiny	Slightly altered	Typical powdery condition
No. 4...	Normal	Thick white fur	Typically altered where contact with penis
No. 5...	"	Slightly sore	Normal

The following shows the treatment given and results obtained:—

Patient	Treatment for 14 Days	Result
No. 1...	Radiostoleum injection 2 c.cm. daily	Improved
No. 2...	Marmite, ½ oz. daily	Scrotum improved; tongue and mouth practically well
No. 3...	Radiostoleum injection 2 c.cm. daily	Scrotum well; tongue and mouth practically well
No. 4...	Marmite ½ oz. daily	Scrotum improved; angles of mouth not much improved
No. 5...	Cod-liver oil daily	Not much improved

At the end of fourteen days they were all placed on ½ oz. of marmite and 2 c.cm. of radiostoleum daily for a further six days, and at the end of the period they were all quite free from evidence of the disease. This observation shows that the condition can be precipitated by unbalancing the diet without the addition of a prussic-acid-containing substance, can be improved by increasing either the vitamin A or vitamin B intake, and be more readily cured by the administration of both vitamins together.

Asulphurosis

I. Sabry (1931), in a paper "On the Chemical Nature of the 'Pellagra Toxin' and the Discovery of the Thiosulphate Treatment of Pellagra," reported his discovery that sodium thiosulphate would cure cases of human pellagra, which he considered to be due to the affinity of the drug for a toxic substance which was the cause of the disease.

In a recent paper on the aetiology of pellagra and allied nutritional diseases, A. Clark (1935) states that prussic-acid-containing foods, such as cassava, maize, sugar cane, millet, guinea corn, peas, and beans, are a common factor present in the diet of all patients suffering from these diseases. He adds that prussic acid combines with sulphur to form thiocyanic acid; the urine and saliva of pellagrins contain a greater amount of thiocyanate than that of non-pellagrins. He has shown experimentally that fatty degeneration of the liver in rats is a constant sequel to the administration of prussic acid or nitriles in sublethal quantities, pointing out that fatty degeneration has been a common finding in the pellagra-like diseases. He postulates

that pellagra and its allied diseases are due to slow prussic acid poisoning, and asks "Is sulphur the P. P. factor?"

Hawk and Bergeim (1931) state that potassium thiocyanate is generally present in the saliva to the extent of several milligrams per cubic centimetre. It has been claimed that this substance is present in greatest amount in the saliva of habitual smokers. The significance of thiocyanate in the saliva is not known; it probably comes from the ingested cyanides present in certain fruits and in tobacco smoke, and from the breaking down of protein material. When 100 grams of tobacco as cigarettes is burned it yields 0.08 gram of hydrocyanic acid (Martindale and Westcott, 1932).

Failure of vision is only an occasional result of the excessive consumption of tobacco, a failure less likely to occur, or more readily cured, if smoking is only indulged in on a full stomach (G. A. Berry, 1893). This is an important observation when considering Clark's theory of slow prussic acid poisoning in the pellagra-like diseases, for it strengthens the supposition that there is a fault in the organism rather than a fault in the ingested material. This supposition is further strengthened by the knowledge that recovery may take place without any change of habit with respect to smoking.

Hawk and Bergeim (1931) remark that the metabolism of sulphur in the body is primarily the metabolism of cystine. The daily sulphur requirement of the body is probably in the neighbourhood of one gram, and is ordinarily supplied when the protein requirement is safeguarded. The sulphur content of foods may be considered as approximately 1 per cent. of the total protein content. It becomes apparent, then, that the diet should contain 100 grams—that is, 3½ oz.—of protein daily in order to satisfy the sulphur requirements of the body; this amount should contain some of the good-class proteins. Generally speaking, the diets in Sierra Leone do not come up to this standard, and are consequently deficient in sulphur.

Randoin and Fabre (1931) have shown that a diet deficient in the vitamin B complex fed to rats caused a fall of the thiol-derivative (sulfhydryl) content of muscle and liver and a rise of these substances in blood. The interpretation of this experiment suggests that either sulphur is mobilized from muscle and liver in the absence of vitamin B or that the organism is unable to metabolize sulphur properly in the absence of vitamin B.

It was decided to use sulphur as a therapeutic agent in the treatment of the A and B avitaminosis disease in Sierra Leone. Contramine (diethyl-ammonium-diethyl-dithiocarbamate) was chosen as a suitable organic sulphur compound. The usefulness of sulphur in the form of contramine by injection being proved, it was decided to use ichthyol, which has a high sulphur content, in further experiments, all of which are detailed below. This drug was only used orally, although it can be given parenterally.

Case 1.—A policeman was admitted to hospital on February 25th, 1936, suffering from avitaminosis—evidenced by a glazed tongue, altered angles of the mouth, and an eczematous, dry, irritable scrotum. He was given full diet and a daily injection of 0.125 gram contramine for four consecutive days; by March 2nd, within a week, the epithelial lesions were cured. This case is cited because it was the first one treated with sulphur, but the result is not conclusive, because there were no dietary restrictions.

Case 2.—A destitute man, an old case of avitaminosis, who had been treated and cured some five years previously with a liberal diet, radiostoleum, and marmite, was admitted to hospital on March 9th, 1936. His tongue was completely glazed; there was some conjunctivitis, and the lower lids of both eyes and the inner and outer canthi were altered. The scrotum was dry, with the rugae completely absent, and appearing as though the skin would easily break. The under surface of the penis was also involved.

He was placed on a strict diet of bread, rice, arrowroot, and beef-tea, daily. No milk or butter was allowed throughout the treatment, and no bathing or local treatment was permitted. He was given daily, on March 9th, 10th, and 11th, injections of contramine 0.125 gram, and on March 12th and 13th an injection of 0.25 gram contramine, making a total of 0.875 gram of the drug. No further treatment was given. There was steady improvement until March 13th, but by March 16th it was apparent that the healing process was stationary; the scrotum had healed completely in the upper two-thirds of its surface, but the lower third remained unhealed in the form of a cap. On this day, March 16th, the patient was given half an ounce of cod-liver oil, with the addition of 10 minims of radiostoleum, and half an ounce of marmite daily; in three days all the lesions were healed.

Case 3.—A seaman was admitted to hospital on April 8th, 1936, suffering from avitaminosis, evidenced by a completely glazed tongue, sore angles of the mouth, the scrotum in a typical eczematous condition and the skin of the lower abdomen, portions of the neck, and back very dry and corrugated; he also had defective vision. He gave a history of having proceeded to sea on March 1st, 1936; during the latter part of the month he felt some vague rheumatic pains, after which the condition just described slowly developed. He was at sea thirty-eight days, and fed on rice, biscuits, and soup. He came straight to hospital from the ship.

He was given a strict diet of arrowroot, bread, and beef-tea; no bathing and no local treatment were allowed during the period of observation. Treatment was started on the day of admission, with ichthyol, 30 grains, in peppermint water, morning and night. The tongue, angles of the mouth, and the scrotum were completely healed, and the vision was normal by April 16th—that is, in eight days.

The following series of cases were observed at the Freetown Gaol:

Case 4.—A male adult was admitted to prison on March 2nd, 1936. In this patient the epithelial lesions were well marked, his tongue was completely glazed, and the angles of the mouth were crusted, sodden, and white; the outer canthi of eyes showed the typical alterations. The whole of the scrotum was in a dry, furfuraceous condition. He was placed in the prison hospital on the same day, and was given a diet composed of the following items: bread, 12 oz.; sugar, 2 oz.; arrowroot, 1½ oz.; sago, 2 oz.; and beef soup, 10 oz. No bathing and no local treatment were permitted. On March 2nd, he was given an injection of contramine 0.125 gram, and his condition gradually improved up to the 4th. By March 5th, the same treatment having been continued daily, the epithelial lesions were markedly improved. On March 6th no treatment was given, but the patient continued to improve. On March 7th no treatment was given, but improvement continued. On the next day the scrotum became normal; the tongue had lost its polish, and the angles of the mouth and the canthi were healed.

Case 5.—A man admitted to prison on January 30th, 1936, was found to be suffering from very marked epithelial lesions, for which he was given vitamin treatment up to February 29th, when he was completely cured. On April 7th he reported with a recurrence of the condition, the scrotum, mouth, and tongue lesions being present. He continued as an out-patient in the same conditions under which he had relapsed, but was given 40 grains of ichthyol twice a day. Steady improvement took place, so that by April 16th the scrotum was quite cured, and the mouth and tongue were almost well. On April 20th there was no trace of the disease.

Case 6.—A man entered prison on March 24th, 1936, with marked epithelial lesions of the disease. He was admitted the same day to the prison hospital, and placed on the same diet as Case 4. The patient was treated with daily injections of 0.125 gram of contramine for four doses. The first injection was given on the 24th, and afterwards the result was as follows:

March 26th. Marked improvement in the scrotum; the mouth and tongue only slightly improved.
March 27th. The scrotum almost completely cured; the mouth and tongue still the same.
March 28th. The scrotum normal; the mouth and tongue definitely improved.

Case 7.—A man was admitted to prison on March 4th, 1936; he was a very marked case of epithelial lesions, the tongue being glazed, the angles of the mouth sore, the scrotum and under surface of the penis involved, and the eyelids affected. He gave a history of three months' duration. He was admitted to the prison hospital on the same day, and placed on the same diet as Case 4. No bathing or local treatment was allowed. The sequels were:

March 4th. Injection with 0.125 gram of contramine was repeated daily for four doses, so that by
March 7th there was considerable improvement. On
March 8th the condition was further improved.
March 10th. The fifth injection of 0.125 gram of contramine was given.
March 11th. The sixth injection of 0.125 gram of contramine followed and there was steady improvement.
March 13th. He was cured.

Case 8.—A man, admitted to prison on April 8th, 1936, was found to be suffering from marked avitaminosis affecting the tongue, angles of the mouth, and the scrotum. He was admitted to the prison hospital on the same day, and was placed on the same diet as Case 4. No bathing or local treatment was allowed.

April 8th. Dose of 40 grains of ichthyol given.
April 9th. Dose repeated.
April 10th. Dose repeated. The scrotum was now nearly well, but there was not much improvement in the tongue and mouth.
April 11th. Ichthyol to the amount of 80 grains in divided doses was given. The scrotum was nearly well; not much improvement was seen in the tongue and mouth.
April 12th. Ichthyol, 80 grains, was given in divided doses; the scrotum was nearly well and there was slight improvement in the tongue and mouth.
April 13th. Dose of 40 grains of ichthyol given. The scrotum was healed, and there was slight improvement in the tongue and mouth. The patient was discharged from gaol.

Case 9.—A man was received at prison on September 17th, 1935, in ill-health with bronchitis, urethritis, and chronic ulcer of leg, all of which were treated and cured. He developed avitaminosis on April 11th; scrotum, oral, and tongue lesions were present. The scrotum had lost all its rugae and was "weeping" and painful so as to hinder walking. He continued as an out-patient on the same diet and under the same conditions which caused the relapse, but was placed on ichthyol (40 grains in peppermint water twice daily), starting treatment on April 11th.

April 13th. Slight improvement was noticed in the scrotum; the mouth and tongue were unchanged.
April 16th. The scrotum was still improving, and the mouth and tongue were greatly improved.
April 18th. The scrotum was better, and the mouth and tongue were almost well.
April 20th. Ichthyol in 40-grain doses given thrice daily.
April 22nd. The scrotum, mouth, and tongue were healed.

Case 10.—A man admitted to prison on May 4th, 1936, was found to be suffering from the epithelial lesions of avitaminosis. The tongue was partly glazed; the angles of the mouth were in the typical condition; and the scrotum showed a well-marked eczematous condition extending on to the under surface and dorsum of the penis near the glans. The genital condition showed slight weeping. The patient was admitted to the prison hospital on May 4th, a photograph was taken of the condition to illustrate the case before treatment, and he was then placed on the restricted diet recorded in Case 4. No bathing and local applications were allowed, and the only treatment was as follows:

May 4th. Injection with 0.125 gram of contramine intramuscularly.
May 5th. Injection of 0.25 gram of contramine. Slight improvement was noted.
May 6th. Injection of 0.25 gram of contramine. The improvement continued.
May 7th. Injection of 0.125 gram of contramine. There was considerable improvement in the scrotum and penis; the mouth and tongue were still improving.
May 8th. Injection of 0.125 gram of contramine. The scrotum and penis were almost well; the tongue was considerably improved; and the mouth was gradually improving.
May 9th. A photograph was taken to show the result of this treatment.

This observation only lasted five days on account of the author's departure from the prison department. The patient was kept on the same regime and no further treatment given until the third photo was taken on May 12th, but, nevertheless, the improvement was sufficiently striking to be seen in the illustrations. The dorsum of the penis was the site of scabies, and has not healed as has the scrotum.

The response of some of these cases to sulphur therapy gives an indication of its possible mode of action.

Case 2 was a destitute and relapsed case of A and B avitaminosis disease, placed on a very poor diet. Nevertheless, it responded to sulphur treatment in the form of contramine parenterally, but the cure was not completed until cod-liver oil and marmite were added to the diet. The inference to be drawn here is that a body deficiency of sulphur rendered these vitamins present in the body impotent. The administration of sulphur enabled the body to benefit from the presence of these vitamins until available stores were all used up, when their administration became necessary to complete the cure.

Case 3 demonstrates the development of the A and B avitaminosis disease without one of the prussic-acid-containing foods being present in the diet. Particularly interesting is the cure of his defective vision with ichthyol whilst on a poor diet.

Case 5 shows the cure with sulphur of a relapsed case, while continuing on the diet and under the same conditions in which the relapse occurred.

Case 8 showed only slight improvement in the tongue and mouth, although the scrotum healed, but it should be noted that this patient was only under observation for five days. The general impression gained whilst observing these cases was that the scrotum yielded to treatment first.

It might be suggested that sulphur is a well-recognized therapeutic agent in the treatment of many skin diseases. In fact, Landor and Pallister (1935) state: "Professor Rosedale has kindly permitted us to say that in a recent experiment on the feeding of rats on vitamin B_2 deficient diets he found a mangy condition of the fur develop which, however, could be cured by the local application of eight parts rape oil with one part of black sulphur." It remains to be explained how sulphur causes the regeneration of the denuded surface epithelium of the tongue and the restoration of visual acuity. It is also very significant that a rich supply of end-bulbs is found in the synovial membranes lining joints, in the intestinal mucosa, and in the sheaths of nerve trunks. In the A and B avitaminosis disease vague joint pains are frequently felt, epigastric discomfort is a constant symptom, and neuritis is a feature of its late or nervous stage.

Conclusions

i. Vitamins A and B are interdependent for their efficient functioning.

ii. An excess of a cereal, not containing a cyanogen group, added to a balanced diet can precipitate the A and B avitaminosis disease.

iii. Vitamins A and B can remain inactive in the organism if its sulphur content falls below a certain level.

iv. Great benefit to the patients and economy in treatment results from judicious sulphur therapy.

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HODGKIN'S DISEASE AND DEEP X-RAY THERAPY

BY

W. L. WATT, C.M.G., M.D.

SURGEON TO THE DEEP THERAPY DEPARTMENT, GUY'S HOSPITAL

The total number of cases under review is 201. These have been treated between the years 1923 and 1934. The great majority of the patients are hospital cases who from the precarious nature of their occupation and living are not infrequently lost sight of and cannot be traced. These cases are simply shown as alive up to the time when last seen, so any comparative statistics given are the minimum, and with fuller knowledge would naturally be higher. My grateful thanks are extended to the members of the staff and others for the great help given in treating and following the cases.

Analysis of Cases

The disease attacks approximately two males to one female. The primary symptoms where known are as follows:

	Cases		Cases
Right cervical	43	Jaundice	1
Left cervical	38	Facial paralysis	1
Right axilla	8	Tonsil	2
Left axilla	2	Herpes	1
Right inguinal	5	Sciatica	2
Left inguinal	4	Purpura	1
Abdominal	7	Appendicitis	1
Pyrexia	6		

Various structures of the body were definitely affected as follows at some time or other in the course of the disease:

	Cases		Cases
Liver	11	Sternum and sterno-clavicular	5
Spleen	49	Spine	12
Breast	10	Hip	2
Mediastinum and lungs ...	76	Humerus	1

The spleen where affected is usually just palpable. The breast shows a diffuse infiltration and may be twice the size of the other. In one case there was ulceration. In the mediastinal cases eight were massive, filling the chest cavity. Twenty-three only showed enlarged hilum glands. In the spinal cases two distinct conditions are present: one a definitely encapsuled tumour in the spinal cord itself, the other a subacute destructive osteitis of the vertebrae themselves. The latter is usually accompanied by severe pain.

The cervical, axillary, and inguinal glands are the ones most affected; of the others, one or both parotids, the occipital, submental, or epitrochlear are occasionally enlarged, and in one case the popliteal.

Clinical Features

Asthenia is the prominent symptom in most cases. It is associated with an anaemic appearance out of all proportion to the blood picture. Typical blood reports are as follows:

Case	Haemoglobin	Red Blood Cells	Leucocytes	Polymorphonuclears	Lymphocytes	Eosinophils
	per cent.					per cent.
1	67	4,300,000	8,600	—	—	2·0
2	90	4,000,000	11,200	69	22	2·0
3	77	4,600,000	13,000	76	18	1·5
4	63	4,000,000	16,000	86	10	2·5
5	81	4,500,000	13,000	72	14	2·0
6	80	4,[illegible]00,000	8,000	62	35	2·0

Atypical blood reports:

7	77	4,600,000	15,[illegible]00	40	16	39·0
8	90	4,200,000	6,500	—	—	3·5
9	68	—	8,500	—	—	5·0
10	62	3,9[illegible],000	38,000	70	12	11·0
11	80	4,6[illegible]0,000	8,000	61	25	6·5
12	45	3,200,000	12,200	38	22	35·0

In the typical case we have a marked drop in the haemoglobin, otherwise a more or less normal blood picture except that there is usually a mild leucocytosis. In certain cases—especially the abdominal, where the iliac and pelvic glands are affected—we may get a marked eosinophilia, as illustrated, and in doubtful cases this may be of diagnostic importance.

Pyrexia is at times the outstanding feature of the case and may persist even when all discoverable glands have disappeared under treatment. It will have been noticed under primary symptoms that the right and left cervical glands are not only by far the most frequent but that they are practically equally affected. The proportion of mediastinal involvement is, however, altogether different; twice as many cases are affected when the right is the primary side than when the left comes first. If any glands are found present, with full treatment and disappearance the temperature may rapidly subside to normal. In two cases the discovery of glands in the upper abdomen explained the cause of the persistent pyrexia. In one case the spleen appeared to be the sole cause.

Abdominal glandular enlargements may be primary or secondary. If primary and the iliac glands are affected oedema of one or both legs may be the first symptom, if the aortic glands, acute obstruction of the bowels may be the first sign. In one case this was found and relieved at operation, in the other it was suspected as a late symptom and was relieved by irradiation. In one case

enlargement of the hilum glands caused jaundice as the first symptom, and in one other the symptoms were those of appendicitis. The true condition was discovered at the operation. Primary enlargements generally do well as a result of treatment. Late or secondary enlargements, however, whilst they may rapidly disappear under treatment, are usually of grave significance, indicating the failure of the general body resistance.

Pain, if persistent, is always suspicious in Hodgkin's disease. Two cases of sciatica, one of brachial neuritis, and one of lumbago were all found to be due to spinal Hodgkin's. Also one case of herpes was due to the same cause.

Not infrequently there has been a history of tuberculous glands, and it is only by local excision and section that the real nature of the fresh glandular enlargements have been discovered. One such case some years after treatment for Hodgkin's disease developed phthisis and was removed to a sanatorium.

Symptoms referable to the stomach are not common. Splenic pain, severe general neuritis, profuse sweats, prickly skin, paralysis of vocal cord, acute deafness of one ear, alopecia, and multiple skin nodules have been occasionally noted. Concurrent diseases were malaria, 3 cases; trench fever, 1 case; psoriasis, 1 case; rodent ulcer, 1 case; infantile paralysis, 1 case; epistaxis, 1 case; and pruritus, 3 cases.

Age Incidence

Decade	1st	2nd	3rd	4th	5th	6th	7th	8th
No. of cases	16	35	61	38	27	15	7	2

Average duration before treatment—11 months.

Duration after Treatment, by Decades

Years to	1	2	3	4	5	6	7	8	9	10	11	12
LIVING:												
1st D.	1	5	3	2	—	—	—	—	—	—	—	—
2nd D.	1	2	8	6	3	2	1	2	1	—	—	1
3rd D.	3	3	12	13	5	6	3	2	—	1	—	1
4th D.	3	5	6	7	2	3	1	1	—	—	1	—
5th D.	—	1	2	2	1	4	1	3	2	—	1	1
6th D.	—	2	3	2	1	1	—	1	—	—	—	—
7th D.	—	—	1	1	1	—	—	—	—	—	—	—
8th D.	—	1	—	—	—	—	—	—	—	—	—	—
DEAD:												
1st D.	2	1	1	1	—	—	—	—	—	—	—	—
2nd D.	1	1	1	2	1	—	1	1	—	—	—	—
3rd D.	1	3	2	1	1	1	2	—	—	—	—	1
4th D.	—	2	—	1	1	2	1	—	1	—	—	—
5th D.	1	—	3	—	1	1	2	1	—	—	—	—
6th D.	1	2	1	1	—	—	—	—	—	—	—	—
7th D.	—	2	—	1	—	—	1	—	—	—	—	—
8th D.	—	—	—	—	—	—	1	—	—	—	—	—

It is worthy of note that 30 per cent. of all cases occur in the third decade, 19 per cent. in the fourth, and 17.5 per cent. in the second. The approximate duration percentages are:

LIVING—		DEAD—		COMBINED LIVING AND DEAD—	
To 2 years ...	18 %	To 2 years ...	34 %	To 2 years ...	26 %
2 - 5 "	54 %	2 - 5 "	36 %	2 - 5 "	45 %
5 -12 "	27 %	5 -12 "	30 %	5 -12 "	28 %

The first period of 2 years is taken because the average duration of life is generally given as that time.

Treatment

General medical treatment is extremely important throughout the whole course of the disease. Arsenic, however, should not be given during or until six weeks after a course of irradiation. In certain cases the combination increases systemic disturbance.

Surgical removal of glands except for emergencies appears to be of no permanent value. This was done in nine cases of those under review, and the longest interval before recurrence was twelve months. In addition glands in the neighbourhood of the scar do not respond so well to irradiation, probably because of circulatory interference.

Ordinary *x* rays act well as long as the glands are localized and superficial. Cases so treated respond afterwards to deep radiations just as well as untreated cases. This appears to be invariably the case no matter what the disease treated.

Deep therapy is recommended because the response to treatment is much quicker, and by varying the voltage and filterage to suit the glands to be treated one can in a short time treat masses of glands no matter where situated. For superficial glands a voltage of 160 to 170 kV is sufficient, combined with aluminium filters or the equivalent of 5 to 6 mm. thickness. A depth dose of 60 per cent. of the skin erythema dose is usually enough. The spleen if palpable should receive a similar amount of irradiation. The first irradiation should usually cover all affected areas and may be spread over a week to a month as necessary. Any recrudescence should be treated at the earliest possible moment. The active focus can usually be found in persistent pyrexia. In this way, after the initial long treatment, patients are as a rule able to carry on their ordinary activities and duties with nothing but an occasional single irradiation to interfere. Periodic inspection of patients cannot be too strongly emphasized.

Summary

While in no sense of the word can deep therapy be considered a cure of the disease, yet it unquestionably prolongs life and often restores the patient to a more or less normal active life in a very short period of time. With regular observation and treatment when necessary there is on the average a three to one hope of living for two to five years and a one to three hope of living for five to twelve years or longer.

In the acute fulminating type to which the young are especially susceptible the patient is usually overwhelmed before treatment can have any effect. The most favourable age incidence is the third decade of life, the least the first.

M. Dulcine (*Rev. de Méd.*, May, 1936, p. 272) accepts the view that the acute rheumatic attack is usually an example of allergy in a hypersensitized organism, and is associated with increase in the blood proteins and a characteristic modification of their distribution. In seven cases he has had good results from blood transfusions, which induce a colloidoclasic shock cutting short the allergic reaction: after an exacerbation (during the first 24–48 hours) with increase of fibrinogen the blood proteins diminish as the acute symptoms subside. The amount given was 100 to 250 c.cm. Dulcine points out that intravenous injections of sodium salicylate have a brief effect and are toxic if repeated. He has sought to combine the two treatments by injecting 50 to 150 c.cm. of blood containing 10 to 20 c.cm. of 10 per cent. sodium salicylate: such mixtures do not coagulate for one to four hours. Four patients, ill with acute rheumatism for three to four days and previously untreated, responded excellently. Nine patients who had proved refractory to domiciliary salicylate treatment improved after repetitions of the injections. It is not claimed that a good cardiac prognosis is assured by this treatment.

INDICATIONS FOR INFANT CIRCUMCISION

WITH NOTES OF A SIMPLER OPERATION

BY

FAUSET WELSH, F.R.C.S.

CASUALTY OFFICER, CHILDREN'S HOSPITAL, BIRMINGHAM

In out-patient practice sepsis is so common after circumcision that my attention has been drawn to defining the criteria for operation and to devising a procedure which will minimize post-operative infection. The latter is most certainly due to the necessity of applying dressings in the child's home, and of the consequent lack of surgical cleanliness.

Aesthetically one may affirm that the natural appearance of the prepuce is at least as good as, if not better than, that after the most perfectly performed circumcision. What, then, are the characteristics of a satisfactory prepuce which requires no improvement at the hands of the surgeon? It should be possible to dislocate it behind the glans penis with simple pressure of the thumb and forefinger without causing pain ; if a constriction is so caused one must estimate if it is likely to produce any degree of paraphimosis ; reduction should be possible with the same ease ; the end of the prepuce should be in a healthy condition, not habitually oedematous or inflamed. If these desiderata are fulfilled there is no reason for performing a mutilating operation, nor indeed for any operation at all.

The next type of prepuce cannot be dislocated on account of adhesions to the glans. These can be separated easily with a probe while the thumb and forefinger gently press back the foreskin. The application of liquid paraffin and subsequent dislocation will prevent their re-formation. Next comes the type where hard pressure is required to perform the dislocation, perhaps also with separation of adhesions. Here paraphimosis with swelling of the glans and pain will follow if the dislocation is not reduced. This and the next class, where dislocation is impossible without tearing or forcibly stretching the prepuce with an instrument, should be classed as cases of phimosis and require operation.

Operative Technique

The operation necessary in most cases is a very simple one, requires no dressing, and can be performed usually without haemorrhage. A general anaesthetic is given to

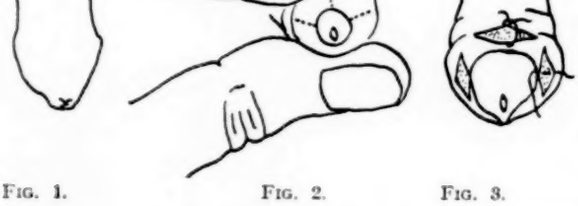


Fig. 1. Fig. 2. Fig. 3.

all children over a fortnight old. The procedure is a simple plastic one for widening the calibre of the prepuce, and consists in making three longitudinal slits in its folded edge. One blade of a pair of sharp-pointed scissors is inserted between the glans and foreskin, and after the loose skin has been pushed back as far as it will go with simple pressure, the three slits are made, avoiding the dorsal arteries and vein. They are three-sixteenths to one-quarter of an inch long, and are placed one dorsally and two laterally. Complete dislocation is then possible, and unless a big vessel has been cut there is very little bleeding. The slits open out into diamond-shaped spaces, in each of which the proximal and distal corners are then sutured together with fine catgut. The operation is completed by reducing the dislocation, when it will be found that the loose skin behind the incisions comes forward and completely covers the wounds. Thus no dressing is necessary, and the parents are told not to meddle with the part at all. The child may have its daily bath. Post-operative care consists in repeating the dislocation on the second, sixth, and tenth days after operation, by which time healing will have taken place. The figures are self-explanatory.

The operation is an elaboration of the well-known dorsal slit, but differs from it in that it produces an aesthetically perfect result without the untidy apron-like effect of the long dorsal slit.

All cases are not suitable for this operation. Where the prepuce is very long or constricted for any length in front of the glans, the incisions have to be made so long that the wounds are not automatically covered by skin, and in these cases a formal circumcision is preferable.

Clinical Memoranda

Age Incidence in Epilepsy

A recent reference in the Press to the notorious "Brides in the Bath" murder trial recalls to mind an important point which was discussed during the proceedings. The murderer claimed in each case that his bride had had an epileptic seizure on the day before her death. His defence was that she must have had another fit while in the bath and as a consequence been drowned. None of the women had been known to have fits previously, and all three were over thirty years of age. The prosecution pointed out that epilepsy is rarely manifested for the first time in a person over thirty. The coincidence of such an occurrence in three wives of the same man imposed an insupportable strain on the credulity of the jury.

An analysis of three hundred cases of epilepsy, almost all idiopathic, examined during the past nine months in St. David's Hospital (for male epileptics) reveals the following facts as regards age incidence:

Onset under								Over
1	2	5	10	15	20	25	30	30
18 =6%	8 =2.6%	23 =7.6%	41 =13.6%	81 =27%	44 =14.6%	24 =8%	24 =8%	37 =12.3%

It will be seen that 12.3 per cent. of the cases were over thirty years of age when epileptic fits first began. Talbot (*Treatment of Epilepsy*) reproduces a table from the thirty-second annual report of Craig Colony giving particulars of 6,595 patients admitted there. In 520 cases the age at onset was unknown ; of the remaining 6,075 cases, 447 were over thirty when epilepsy began—that is to say, 7.35 per cent.

The large discrepancy between 12.3 and 7.35 per cent. may possibly be accounted for in two ways. First, the table reproduced above concerns a relatively small number of cases. Secondly, of the 6,595 patients in Craig Colony, no fewer than 1,830 were under five years of age, or 28 per cent. Such children have a high mortality. Of the 300 cases at St. David's Hospital all when admitted were over fifteen years of age, and their history showed that in only 6 per cent. of cases had epilepsy developed before the age of five. All patients at St. David's Hospital are sane and are capable of some work in the hospital and its grounds and workshops. Indeed, it is a condition of suitability for admission that they should be capable of

work. Despite the relatively small number of cases quoted, it seems reasonable to conclude, therefore, that such a group more closely corresponds to the type of epileptic who is at large in the general population than the aggregate of those admitted to Craig Colony. On this assumption the figure 12.3 per cent. may more nearly represent the proportion of living adult epileptics whose malady has first been manifest after the age of thirty than the smaller percentage deduced from the Craig Colony statistics.

The point is of some small medico-legal interest. Epilepsy is often advanced as a defence in cases of murder and other acts of violence. It is observed in a number of cases that the accused has appeared dazed for a considerable time after the crime and seems genuinely to have no memory of it. Post-epileptic automatism and the "epileptic equivalent" are recognized phenomena. But if the accused has no history of epilepsy, and especially if he be over thirty years of age, counsel for the defence is not likely to obtain a sympathetic hearing. Nevertheless, an unhappy feeling must remain in the mind of many a doctor who reads of the execution of a murderer suspected of being an epileptic. Even to those who are in favour of capital punishment, epilepsy must appeal as an excuse greatly mitigating the crime. On the other hand, epileptics accused of crime have been known to boast of their imperviousness to conviction!

A. J. M. BUTTER, M.A., M.D.
Medical Officer, St. David's Hospital.

London, N.

An Unusual Foreign Body in the Trachea

The following case is of interest in view of the unusual nature of the foreign body, and also of the time which elapsed before the child was brought to hospital.

A girl aged 4½ years was brought by her mother to the Royal Edinburgh Hospital for Sick Children on April 17th, 1936. When seen in the medical out-patient department she seemed to be very nervous and hysterical, was very hoarse, and had a marked wheeze. The mother stated that she thought the child had swallowed some egg-shell while eating an egg six days previously. The mother also stated that the child had a cough resembling whooping-cough, which had a sudden onset as if the windpipe were choked. The child was seen by the physician in charge, who suspected a foreign body, and referred her to the ear, nose and throat department. She was admitted to the ward under the charge of Dr. Charles E. Scott, to whom I am indebted for permission to publish these notes.

On examination in the ward the child seemed very pale and had a marked stridor both on inspiration and on expiration, but there was no cyanosis. No abnormality was detected in the pharynx. Under general anaesthesia I passed a laryngoscope and observed a piece of egg-shell impacted in the mid-line of the trachea immediately below the vocal cords; only the edge of the egg-shell was visible through the laryngoscope. It was thought that if the egg-shell were gripped with forceps it would break in pieces, but in the hope that some of the membrane of the egg would still be attached to the shell an attempt was made to extract it by this means. Numerous small pieces of the egg-shell were removed, but it was feared that some of the pieces had fallen further down the trachea. After this examination the stridor disappeared and the child was returned to bed. An *x*-ray picture of the chest was taken shortly afterwards, and, to compare the density of any shadows that were seen, an *x*-ray picture of the egg-shell was also taken. The plate showed a doubtful shadow in the neighbourhood of the right bronchus, and on the following day I carried out a bronchoscopic examination, but could not detect any egg-shell in either bronchial tree.

The child was very sick after this examination and developed a marked acidosis. The following day she was very much better and was discharged well six days after admission.

A. BROWNLIE SMITH, M.D., F.R.C.S.,
Assistant Aural Surgeon, Royal Edinburgh Hospital for Sick Children.

Reviews

ADVANCES IN MENTAL MEDICINE

Twentieth Century Psychiatry: Its Contributions to Man's Knowledge of Himself[1] is the title of a deeply interesting monograph written by Dr. WILLIAM WHITE, the distinguished American psychiatrist. Forty-three years ago, when the author entered the New York State service, psychiatry hardly existed as a medical specialty, and the average hospital psychiatrist was little if any removed in his understanding of mental cases from the ward attendant, and far less informed than the present-day social worker, although this latter comparison he realizes is hardly a fair one to the psychiatrist. Such scientific efforts as were made consisted of a combination of clinical work at the purely descriptive level with a pathology that was of the dead-house variety.

Dr. White maintains that no department in medicine has advanced so rapidly as psychiatry, and this view would seem to be fully justified. The first great reform achieved was the "no restraint" movement, the importance of which has even now not been fully appreciated; later the epoch-making work of Kraepelin, and Munich became the Mecca of psychiatry all the world over. The psycho-analytic movement made its appearance in the early years of this century, and was represented in America by a very small group of men, who organized the first society in 1911. They were fortunate from the beginning to enlist the support of Dr. James J. Putnam and Professor G. Stanley Hall, who softened a good deal of the bitter antagonism which developed against it from the very earliest days, particularly because of its emphasis on sex.

The second part of this book is devoted to a study of the social significance of psychiatry, and the third to the general implications of psychiatric thought. These problems are admirably discussed, and they fully deserve careful study by psychiatrists in this country. In concluding his last chapter Dr. White observes that there are innumerable matters that might properly receive attention in such a discussion as this, but there are three directions in which he looks for progress as a result of psychiatric developments which will lead to important results. (1) In general medicine: the wider and more informed recognition that the relationship between patient and physician constitutes the most important tool of therapy. (2) In general science: the recognition that investigations of the neurological and psychological foundations of such concepts as space and time constitute an all-important avenue of approach to the elucidation of their deeper meanings and significances. (3) In the field of sociology: the study of the phenomena of, and the factors that lie behind, war and peace.

This is an outstanding monograph, and will be welcomed by psychiatrists in this country.

POPULATION PROBLEMS

Mr. GLASS'S *The Struggle for Population*[2] and Dr. KUCZYNSKI'S *Population Movements*[3] overlap, and both deal with the same topics as Professor Carr-Saunders's *World Population*, to which we refer in a leading article this week. But Dr. Kuczynski writes primarily as a statistician concerned to set out the facts of population movement, while Mr. Glass is primarily concerned with

[1] *Twentieth Century Psychiatry. Its Contribution to Man's Knowledge of Himself.* By William A. White, M.D., A.M., Sc.D. London: Chapman and Hall, Ltd. 1936. (Pp. 198. 10s. 6d. net.)
[2] *The Struggle for Population.* By D. V. Glass. London: H. Milford, Oxford University Press. 1936. (Pp. 148. 7s. 6d. net.)
[3] *Population Movements.* By Robert R. Kuczynski. London: H. Milford, Oxford University Press. 1936. (Pp. 121. 5s. net.)

efforts made in Belgium, France, Germany, and Italy to increase population. Both books are quite short and lucidly written. The simple facts are that in West Europe (of course including Great Britain), unless there is a change in fertility, the populations will, after a latent period of less than a generation, begin to decline, and will thereafter decline in geometrical progression, so that a hundred years hence the population will have fallen to half its present numbers or even less. In this country there is no present sign of official or private alarm. In Europe Governments are alarmed and measures have been taken. Mr. Glass concludes that only in Germany is there much evidence of success, and this success is limited and may be only temporary. He does not expect much success unless and until the subject is really brought home to all citizens. Dr. Kuczynski very well explains the difficulties. He points out clearly that there is, in our present state of chaos, an opposition between the individual and the group interest. If, to take one of his excellent illustrations, house agents practise birth control, then, as things are, they will certainly be able to do better for their limited families. But if their clients practise birth control to an even greater extent, the house agents (with their families) will be ruined. Or, if the production of children were stopped altogether, for a while the fertility strikers would have more money to spend on picture palaces and motor cars ; but the manufacturers of baby-linen and perambulators would be immediately ruined, those catering for toddlers soon ruined, and teachers out of work in a few years.

The problem to be solved is to make parents desire to rear more children. No measure yet proposed, or likely to be proposed, will make the larger family unit economically better off per capita than the small unit. Whether from the ideological point of view a change is possible remains to be discussed. The authors think the problem urgently needs examination, and they have provided in useful form data which are essential to such examination.

A FRENCH WORK ON PATHOLOGY

The scope and functions of " pathology " as a subject in the medical curriculum are very variously regarded, and to judge by Journé and Deschamps' *Manuel de Pathologie Médicale*[4] the outlook upon it in France is very different from ours. The study of pathology should have as its aim the fullest possible understanding of disease, and thus involves inquiry into its causes, direct and predisposing, the changes, gross and microscopical, which it produces in the body, and the mechanism whereby its progress is arrested. The basis upon which a textbook of pathology should be constructed is thus, in our view, a description of the process of disease in terms of morbid anatomy. In this volume, on the contrary, the basis is clinical. Symptoms and signs of disease are described first, and each section ends with a discussion of treatment ; in comparison with these features the paragraphs devoted to aetiology and morbid anatomy appear in our eyes disproportionately short. Clinical classification leads to the discussion as distinct subjects of such matters as " cough," " anorexia," and " aerophagy," which have no characteristic pathological basis ; an illuminating example of this attitude is " méningite vermineuse," an astonishing subheading, which proves to refer to nothing more than the occurrence of fits in children with intestinal worms. The fact that there is no meningitis in the true sense in such cases gives point to this criticism of such a method of classifying disease. Morbid histology receives only scant mention, and there are no illustrations. In some directions the book is far from being up to date ; for example, the last word on the aetiology of influenza is *Bacterium pneumosintes*, and modern work on the macrocytic anaemias is presented only in brief and ill-digested form, Castle (one of very few investigators outside France to be mentioned at all) being referred to as an " English " physician. The main interest and use of this book to the foreign reader lies in its description of syndromes, evidently well recognized in France, with some of which we are not familiar. It is from our standpoint a textbook rather of medicine than of pathology.

[4] *Manuel de Pathologie Médicale.* By Maurice Journé and Pierre-Noel Deschamps. Third edition. Paris: Masson et Cie. 1936. (Pp. 1,702 ; broché en deux vols., 90 fr. ; relié, 110 fr.)

APPENDICITIS FOR THE BEGINNER

During the present century many notable monographs on the subject of *Appendicitis* have been published ; those of Lockwood, Deaver and Kelly are perhaps the best known of these. The latest work with this title[5] has been written by Dr. Stewart McKay, surgeon to the Lewisham Hospital, Sydney, but it is impossible to compare his book with the others since it has been prepared with a very limited aim in view. This must be constantly borne in mind when attempting to assess its value. In the preface the author says that he at first intended to entitle the volume " His First Appendix Operation," and as a description of the contents it would perhaps have been better if it had been left at that, for it is really an elementary guide for the veriest novice at surgery.

The conditions of practice in some parts of Australia are evidently so different from those obtaining in this country that it is difficult to comprehend the need for much of the axiomatic details given, and we cannot help feeling that in many respects the book has been written for a past generation of doctors. One assumes nowadays that the mere possession of a medical qualification is sufficient guarantee that no practitioner can need elementary instruction in simple aseptic technique, nor should his command of language and common sense demand the aid of a specimen conversation between surgeon and relatives before the operation. And yet in many parts the book is quite up to date and well informed, so that the reading of it leaves one with a feeling of anachronistic chaos. Can it really be that the country practitioner in Australia has so little resource that he needs such very rudimentary instruction as, " When he has stripped off all but his socks he draws on white washing pants and an undershirt, and to complete his costume he wears white tennis shoes with thick rubber soles "? The most interesting commentary upon this is given by the author himself in the previous paragraph, when he relates that he saw a former president of the Royal College of Surgeons perform a hysterectomy after " merely divesting himself of his immaculate frock coat and putting on a gown."

We have much sympathy with the idea of a book designed to give the absolute novice detailed information as to the conduct of a case of appendicitis if he be forced to handle the case without help, but even so we cannot bring ourselves to believe that it is necessary to say " in the changing room there should be several metal pegs on which he can hang his clothes and underclothes ; not a single peg " ; nor would it seem in keeping for such a novice to attempt the sterilization of his own catgut as is recommended in a later chapter. The minutiae of the operation itself are well described, and many useful hints are given in the chapters on after-treatment and complications.

The impression gained from the book is that far too much space has been devoted to unimportant details and

[5] *Appendicits. When and How to Operate. A Guide for the General Practitioner.* By W. J. Stewart McKay, M.B., M.Ch., B.Sc. Sydney: Angus and Robertson, Ltd. London: Australian Book Co. 1936. (Pp. 260 ; illustrated. 12s. 6d.)

too little to the essentials. Many of the author's views are somewhat unorthodox, but his considerable experience commands respect for his opinions, and we have no quarrel with him on these grounds. Not the least interesting chapter is that in which the author gives his views as to the aetiology of appendicitis. He believes that it is common in individuals who have inherited an "exuberance of lymphoid tissue" in the appendix, and that this is almost invariably associated with a similar increase in the lymphoid tissue in Waldeyer's circle in the nasopharynx. Such individuals are very prone to catarrh as the result of a chill, which latter he therefore considers "the chief cause of appendicitis." No surgeon of experience can doubt the close relationship between infections in the lymphoid tissues elsewhere and those in the appendix, but not many will find the theory of a causative chill acceptable. The so-called chill is usually the result of the initial infection, not its cause.

Despite these criticisms we have found the book interesting reading; it will be of greater value to nurses than to doctors, but it cannot, of course, be compared with the monographs previously mentioned. The author evidently does not wish it to be, for he says in the preface: "I set about my task with the idea that it was to be a guide for the general practitioner who thinks that he would like to try and remove a diseased appendix." If the practitioner really needs all the elementary instruction given in this book we feel doubtful of the advisability of his making the trial.

A MANUAL OF BIOCHEMISTRY

One of the interesting tasks of the future historian of science will be to trace the development of the "borderline" sciences, such as biochemistry. In doing so he will have recourse to the series of textbooks which have appeared as the years have passed. It is likely that Dr. Pierre Thomas's *Manuel de Biochimie*[6] will form a landmark in the series. It is an important book from several points of view. In Part I the author gives a brief but admirably clear summary of those portions of modern chemical theory which bear most directly upon biochemistry. In the second, third, and fourth parts he discusses the chemistry of compounds of biochemical interest, the chemical mechanisms of synthesis and breakdown, and the special constituents of various tissues.

The approach is essentially from the chemical rather than from the biological point of view. The author's interest is clearly rather in the nature of the substances he describes than in the tissues which form them or break them down. Without the discipline of chemistry and the use of chemical theory and technique, biochemistry could not exist. But without constructive thought on biological lines it cannot progress. This is no reflection on Dr. Thomas's valuable book: quite the contrary. But it throws it into sharp contrast with some of the earlier textbooks on the subject, in which a much stronger biological bias and a much less complete chemical treatment are manifest.

To the worker in biochemistry and to the advanced student it is of the utmost assistance to have a book in which the constitution, chemical properties, and structural formulae of a very large number of important biological compounds are clearly set out. The sections on the sterols and the vitamins are particularly good and are thoroughly up to date (how long they will remain so is another matter; but the author of any biochemical textbook must be prepared to find his work out of date almost before it is published). Pharmacology, with admirable logic, finds a place as a branch of biochemistry, for many pharmacologically important alkaloids are described. Finally, the brevity and clarity of the French language has allowed the author to put into less than a thousand pages information which in English would require perhaps fifteen hundred pages and in German two thousand or more.

The historian of science will find in this book not only a reflection of the position of biochemistry in the year 1935, but also indications that chemistry is now contributing more fully than ever before to the shaping of biological thought.

[6] *Manuel de Biochimie.* By Pierre Thomas. Paris: Masson et Cie. 1936. (Pp. 978; 51 figures. 180 fr.)

CHARCOT-MARIE-TOOTH PARALYSIS

The aim of *The Treasury of Human Inheritance* is to apply the modern science of genetics to the study of hereditary human disease. In the last number, *On the Peroneal Type of Progressive Muscular Atrophy*,[7] Miss Julia Bell has analysed 620 cases of this disease, either collected from the literature or observed by herself. That she has chosen as title the name used by Tooth in his original paper indicates how little knowledge of this disease has increased in fifty years. In fact, Miss Bell's paper is the most important contribution since the original description by Charcot and Marie and by Tooth in 1886, and the remarkable pedigree published by Herringham three years later.

It might have been expected that so characteristic a disease would have been transmitted in a regular manner. But Miss Bell does not find this to be the case. In some pedigrees the disease is transmitted only to males, almost always by unaffected females; in others it may be transmitted by either parent to children of either sex. While most pedigrees indicated transmission as dominant, a few pedigrees suggested a recessive form of inheritance. In these families the disease tended to appear unusually early in life. An interesting family was examined in which inability to taste phenyl-thiocarbamide was transmitted in two sibships to the same members as were affected with peroneal atrophy. The discovery of "non-tasters" in a family afflicted with hereditary disease of dominant character may thus provide a means of predicting which members are likely to be affected in later life.

Notes on Books

In *The Therapeutic Agents of the Pyrrole and Pyridine Group*,[8] Dr. W. F. von Oettingen gives a systematic account of the pharmacological actions of extensive groups of compounds, which include many alkaloids of outstanding importance in pharmacology and medicine. The scope of the work is illustrated by the fact that in a single table a summary is given of the actions of no fewer than forty-three tropine esters. The volume contains twenty-eight tables of this character, although not all of them are quite so extensive. By the lavish use of tabular material and of structural formulae the author has been able to compress an enormous amount of information into a small compass and to show a number of interesting correlations between chemical constitution and pharmacological action. The medical profession only hears of those new synthetic compounds which succeed in establishing a place for themselves in therapeutics, but a book of this character indicates the laborious systematic testing of long series of compounds that is necessary for the production of a single useful new drug. The production of the volume

[7] *The Treasury of Human Inheritance. Vol. iv, Nervous Diseases and Muscular Dystrophies. Part II, On the Peroneal Type of Progressive Muscular Atrophy.* By Julia Bell, M.A., M.R.C.P. (Under the Medical Research Council.) London: Cambridge University Press and H. K. Lewis and Co., Ltd. (Pp. 140; 14 figures. 12s. 6d. net.)

[8] *The Therapeutic Agents of the Pyrrole and Pyridine Group, including the Tropinol, Scopoline, Ecgonine, and Granatoline Derivatives.* By W. F. von Oettingen, M.D., Ph.D. Ann Arbor, Michigan: Edwards Bros. Inc. 1936. (Pp. 258. 4.75 dollars.)

at a reasonable cost has been made possible by the use of an interesting new process—namely, photolithography from typescript. The publishers, Messrs. Edwards Bros. of Ann Arbor, Michigan, explain that they are adopting this method in certain cases in order to be able to produce technical works in small editions at a reasonable cost.

What They Wore[9] is the title chosen by Dr. Margaret Jackson for a history of children's dress in this country. The author's first interest in her subject was evoked by the difficulty of dressing a period play at a school dramatic society; later she began to regard it from the wider aspect of hygiene and psychology. A glance at the delightful drawings by O. H. Lister, which illustrate the book, shows that the modern child now enjoys a more rational garb than at any period since the Stone Age. From eary mediaeval times children's clothing gradually became more complex, more voluminous, and less hygienic, culminating in the unpractical and unaesthetic garments inflicted on the unfortunate Victorian child. This unpretentious little book is written with sympathy and humour. The bibliography includes the works of forty-five different authors, and the index, chiefly referring to obsolete items of dress, is one that will tax the vocabulary of most readers.

At the Point of a Lancet[10] is the title of a book about the Canton Hospital, which was first opened in 1835 for the treatment of eye diseases. So many Chinese came for other complaints that ere long it had to widen its scope till it became a general hospital. Dr. W. W. Cadbury and Miss M. H. Jones tell the story of the various vicissitudes which the hospital has experienced during its hundred years of ever-increasing work. China owes the introduction of scientific medicine to Protestant medical missionaries. Dotted over the republic are similar hospitals, which have been a boon to the country. Some of them have also undertaken medical education. The famous Chinese political reformer Dr. Sun Yat Sen graduated M.D. from the Canton Hospital College. This book is written more especially for those interested in medical missionary effort rather than as a record of professional work. It records the Christian fortitude which animated the Reverend Peter Parker, D.D., M.D., who first established the hospital on lines which were followed by his successors. The keynote of the book lies in a sentence from the introduction: "Countless numbers of men and women who entered its doors in despair and without hope in this world left it radiant with joy in the new life that had been revealed to them."

The work on Diphtheria,[11] by Dr. G. Carrière, professor of clinical medicine at Lille, can be recommended as a concise and lucid exposition of the disease as seen through French eyes. Several items, however, call for criticism. In the opening lines the word diphtheria is derived from a non-existent Greek word, and in the very brief historical introduction we miss the names of Klebs or Schick, though Loeffler and Ramon are mentioned. In the section on bacteriology no reference is made to the gravis, mitis, and intermedius types of the diphtheria bacillus. The statement on page 66 that it has not been proved that paralysis is most frequent in the severe forms of diphtheria betrays ignorance of the literature. Undue value is attached to local treatment of the nose and throat—which, in the reviewer's opinion, is unnecessary, if not actually harmful—as well as to Milne's treatment with eucalyptus spray which, though obsolete in this country, still survives in France. Lastly, although a few foreign writers are quoted in the text, the scanty references at the foot of the page, or appended to a few of the chapters, are exclusively to French authors and mainly to Paris theses.

[9] *What They Wore. A History of Children's Dress.* By Margaret Jackson. London: G. Allen and Unwin Ltd. 1936. (Pp. 160; illustrated. 4s. 6d. net.)

[10] *At the Point of a Lancet. One Hundred Years of the Canton Hospital, 1835–1935.* By William Warder Cadbury, A.M., M.D., F.A.C.P., and Mary Hoxie Jones, B.A. Shanghai and London: Kelly and Walsh, Ltd. 1935. (Pp. 304; illustrated. 10s.)

[11] *La Diphtérie.* By G. Carrière. Paris: Masson et Cie. 1936. (Pp. 214; 46 figures, 3 coloured plates. 35 fr.)

Preparations and Appliances

UNIVERSAL INTESTINAL CLAMP

Mr. C. Naunton Morgan (London, W.1) writes:

The instrument here illustrated consists of two angled Payr's clamps, which can be held accurately and firmly together by an ingenious locking device. When the instrument is complete, as in Fig. 1, a very useful angled Rankin's clamp is

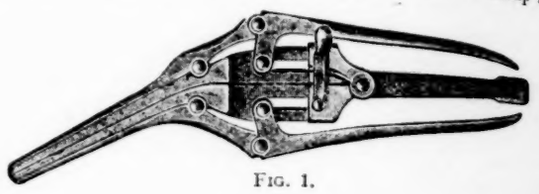


Fig. 1.

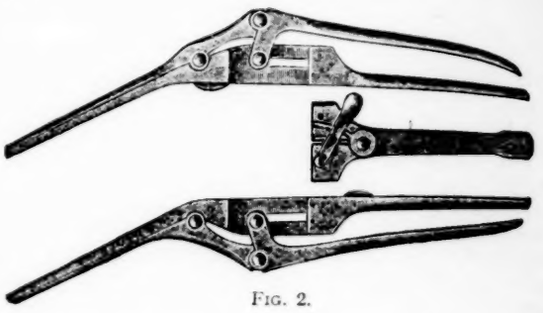
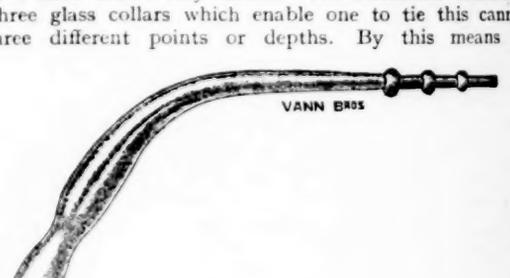


Fig. 2.

available for colectomy by extraperitoneal operation. This modification of Rankin's clamp has the following advantages: (1) that the two limbs of the colon may be clamped separately, approximated, and held firmly; (2) that either portion of the clamp can be removed separately, so that the patient need not have the complete instrument applied for a whole week—further, that the risk of the clamp moving is greatly reduced and bandaging considerably facilitated. It will be noted that each of the two Payr's clamps, when separated and with the jaws fully opened, has a different angle of action, and may be used for other gastro-intestinal operations (Fig. 2). The clamp is constructed of carbon steel, since it has been found possible to make it much lighter and of greater strength than it would have been with the usual stainless steel. This instrument has been made for me by Messrs. Vann Bros. Ltd., 63, Weymouth Street, London, W.1.

AN INTRAVENOUS CANNULA

Mr. Maurice Lee (London, W.1) writes: The glass cannula illustrated below is a modification of the Horrocks's cannula which I have found very useful. The alteration consists of the three glass collars which enable one to tie this cannula at three different points or depths. By this means the



cannula can be kept in the vein in giving continuous intravenous saline, and it is not likely to slip. It must be noted that the collars are on the outside of the glass and that the internal lumen is perfectly smooth.

CHOLAGOGUE LAXATIVE TABLETS

Veracolate brand tablets (William R. Warner and Co. Ltd., 300, Gray's Inn Road, W.C.1) contain bile salts (sodium glycocholate and sodium taurocholate) and purgatives (extract of cascara sagrada and phenolphthalein), together with a small amount of resin of capsicum. The purpose of the tablets is to act as a cholagogue and a laxative.

PUBLIC HEALTH IN THE UNITED STATES OF AMERICA*

III.—MODERN SERVICES

BY

RALPH M. F. PICKEN, M.B., Ch.B., B.Sc., D.P.H.

MANSEL TALBOT PROFESSOR OF PREVENTIVE MEDICINE, THE WELSH NATIONAL SCHOOL OF MEDICINE

In this article it is proposed to deal briefly with some of the modern public health activities which have developed in America, as in Great Britain, during the present century. Generally their evolution has been similar in the two countries. As in everything else there is greater variation from place to place in the U.S.A. On the whole, treatment at clinics by whole-time officers of local authorities is less common. More use is made of the private practitioner, either in his private capacity or as a paid part-time officer. Reference for treatment to voluntary hospitals or clinics is customary for those who cannot afford to pay a general practitioner or specialist. Voluntary nursing associations play a much bigger part in domiciliary and clinic care, especially of children, than they now do with us. The fact that midwifery in the U.S.A. is to a much larger extent the province of the medical practitioner affects both the qualifications and the work of the nurse-visitor.

Tuberculosis

Organizations for the treatment and prevention of tuberculosis are now more or less standardized throughout the civilized world, comprising notification, clinics (for diagnosis, special treatment of the ambulatory case, and post-institutional care), diagnostic laboratory service, sanatoria, and hospitals, and home visitation by trained nurses. The American county or small municipality is an unsuitable unit for an efficient scheme of this kind. Hospitals and sanatoria may therefore be provided either by the States or by local authorities (sometimes with State assistance). The State health departments usually keep in very close touch with the actual clinic service provided by local authorities or may actually carry it out for them. Very often it is based on an institution and its resident staff. In addition, quite a large number of beds are still provided by voluntary or private bodies. Thus in New York State (population six millions) there were in 1931 four State sanatoria with 1,050 beds, thirty-four county or city hospitals with 3,941 beds, and twenty-eight other institutions with 3,661 beds, in addition to children's preventoria, open-air schools, and summer camps for the tuberculous. The total number of beds in 1935 exceeded 9,000. The annual deaths being around 3,000, the ratio of beds to deaths is as 3 to 1. The death rate from all forms of the disease fell from 161.5 per 100,000 in 1900 to 52.6 in 1934; for pulmonary tuberculosis in the same period the rate fell from 139.5 to 48.4. These rates were falling before the service was organized (nearly all the public beds have been provided since 1910), but, as in this country, the rate of decline has been accelerated in the last fifteen years.

The proportion of public beds in tuberculosis hospitals and sanatoria to population is often high. For instance, their number in New York State in 1935 was 5,461, being at a rate of rather less than 1 per 1,000, and about the same rate holds for the much smaller area of Rochester and Munroe County within that State. In Massachusetts with a population of 4,300,000 and about 2,000 deaths per annum, there are 5,200 beds. Few counties or towns in Great Britain reach this proportion. Nevertheless the high ratio of beds to deaths is mainly due to the very low rate of mortality which now prevails. In Massachusetts there is a tendency to divert some of the accommodation to the treatment of cancer.

It is difficult to say how much of the decline of tuberculosis is due to improvement of the milk supply, because little is known as to the proportion of cases caused by the bovine type of bacillus. So much has been heard about pasteurization (75 per cent. of all milk sold in New York State is pasteurized, the proportion varying from 95 per cent. in the sixty cities to 27 per cent. in the rural areas) that the efforts to eradicate tubercle in cattle are apt to be overlooked. Practically every cow in New York State has been submitted to the tuberculin test and the reactors have been slaughtered. Only 1 per cent. reacted in 1935 as compared with 50 per cent. in 1919, when the work began.

In some areas quite large surveys are being carried out. For instance, 50,000 paupers in New York City were recently *x*-rayed at the rate of three per minute. Of these 5.7 per cent. were found to require further investigation and 2.5 per cent. were found to be definitely suffering from pulmonary tuberculosis. At Rochester (N.Y. State) 12,000 school children have been *x*-rayed, among whom 2.5 per cent. were found to show evidence of chronic pulmonary disease (active or quiescent) and 1 per cent. to have lesions urgently requiring treatment. Among them 1,200 were submitted to tuberculin tests, with the result that 27 per cent. were found positive, the percentage at 18 years being 35. A very elaborate investigation has been proceeding for the past four years among the rural population of Williamson County, Tennessee, under a scheme financed by the Rockefeller Foundation and the State. Here 45 per cent. of 1,500 children have reacted to the Mantoux test, although there is little meningeal or generalized tuberculosis in children. Altogether 2,500 complete examinations have been made. Perhaps the most interesting observation at Williamson is the high incidence of tubercle in old age, and *especially among elderly women*, in this rural population.

Venereal Diseases

The most notable feature of the attempt to control venereal diseases in the U.S.A. is that some form of notification is in existence in many areas, either to the State health department or to the local health officer. It is not claimed that notification is complete. The comparatively low proportion of cases of gonorrhoea usually reported suggests that it is not, although in Massachusetts there are about 7,000 cases of gonorrhoea to 4,000–5,000 cases of syphilis each year. Local health officers are expected to seek out sources of infection, but there appears to be some hesitancy to carry out this duty, or to impose the restrictions on infective persons which some of the State laws permit. Free treatment as a rule is only available for the poor, and there is little State subsidy of local schemes.

The venereal disease problem, indeed, is causing more concern to those who are interested in public health than any other of its aspects. So far as records go there is no sign of any abatement in its incidence. The American Public Health Service is collecting information as to its behaviour, and publishes every month a useful summary of recent work called "Venereal Disease Information," which is distributed free to all medical officers of clinics and health officers. There is widespread dissatisfaction with the present clinic system and great interest in the success which has attended the Scandinavian system of reporting, follow-up of contacts, and compulsory treat-

* This is the third of a short series of articles on public health in the U.S.A., contributed by invitation.

ment. It is likely that the next big drive in public health will be directed at venereal diseases, and it will be interesting to see what form it takes.

Maternity and Child Hygiene

Here again, although these are regarded as essentially local services, there is division of function as between State and local authority, the former not only legislating, supervising, and assisting local health departments, but entering also into the field of executive work. Thus the New York State Department conducts, as a demonstration, prenatal clinics through two staff units working in thirty-four to forty small municipalities. In 1934, 414 such consultations were held at which 5,000 attendances (including 740 of infants) were made. Similarly, a peripatetic clinic for toddlers held 575 consultations in twenty-nine counties during 1934, examining 14,600 children. Midwives are licensed and supervised by the health department of the State. Medical inspection and treatment of school children, on the other hand, is a function of the State education department and of the local school boards or boards of education, except in New York City, Rochester, and Buffalo.

In Tennessee State effort has been concentrated upon the establishment of efficient county health units, with a minimum of one whole-time health officer and two nurses, providing prenatal, post-natal, and infant clinics, and school medical inspection and treatment, as well as home visitation in collaboration with the local medical profession. Rutherford County is an example of this type of organization, its development having been fostered as a demonstration by the Commonwealth Fund and the State. In this rural county of 33,000 persons (25 per cent. coloured) and covering 600 square miles, these services radiate from a cottage hospital and an admirably designed health centre at Murfreesboro. The staff includes two whole-time medical officers and seven nurses. In 1933 the number of mothers who received prenatal care represented 43 per cent. of the births, while post-partum visits were made by nurses to 55 per cent. In the same year 67 per cent. of the children born and 42 per cent. of the pre-school group came under the care of the department, the former receiving an average of 4.7 visits each and the latter 2.3. Each school child is examined four times by routine and on any other special occasion as required. Defects are carefully followed up for correction. In Williamson County (population 23,800—about 5,000 coloured) there are four nurses. Prenatal visits are made to about 74 per cent. of the women about to be confined. The difficulties in a southern American State have to be observed before the nature of this achievement can be properly appreciated.

In Massachusetts, where the local health organization suffers from the somewhat primitive system of local government already mentioned, the State health department has a very vigorous bureau of child hygiene. It maintains direct contact with pregnant women by means of prenatal letters, 25,000 of which are forwarded to women each month. In this State school hygiene is included among the functions of the State health department.

The large city departments devote a great deal of attention to maternal and child hygiene. In Chicago, where 50,000 births occur annually, a staff of 200 nurses is carried for home visitation and a further 100 are attached to voluntary clinics. The amount of printed advice issued to the public is enormous. Among other things, a letter is sent to the mother every month of the first year of her baby's life. The percentage of infants breast-fed is said to have been raised by these means from 10 to 70. At Rochester, with a population of 336,000, school medical and infant care are integrated, and a staff of sixty-nine nurses is employed for the purpose. There appears to be less dependence upon voluntary organizations than is usual in the U.S.A. In this city there are only three whole-time medical officers, examinations both at schools and at clinics being conducted by private practitioners acting in a part-time capacity.

Nutrition

The problem of nutrition of mothers and children is being approached in many areas through the agency of women officers called "nutritionists." For instance, in Massachusetts the State health department has five such officers, who advise and consult with local public health nurses in addition to acting as consultants on dietetic problems at institutions. The Visiting Nurse Association of New Haven, which is responsible for most of the domiciliary care of mothers and children in that city of 160,000 persons, has two nutritionists on the staff for consultation with the district nurses and the advising of mothers referred to them.

Infant Mortality

If statistical facts can be regarded as a measure of the effectiveness of these efforts, it is interesting to note that the trend of infant mortality has been much the same in America as in England and Wales. It has fallen steadily from 100 per 1,000 live births in 1915 to 60 in 1934 (U.S. Registration Area). The general rate is affected by a high mortality among coloured infants. Whereas the rates for the white population were 99 in 1915 and 64 in 1928, those for coloured in the same years were 181 and 106, the combined rates in 1928 being 69. In New York City the rate in 1934 was 52.6, in New York State 51.2, and in Rochester 48.3. In Chicago it is said to be as low as 47.

Maternal Mortality

The maternal mortality rate, on the other hand, which appears to correspond fairly closely with the Registrar-General's puerperal mortality rate calculated on *live* births, is consistently high, and shows a slightly upward tendency. It was 6.1 per 1,000 in 1915, but 7.0 in 1928. For whites these rates were respectively 6.0 and 6.3; for coloured women, 10.6 and 11.3. It may be noted that the proportion of births taking place in institutions is usually high. For instance, in Chicago it is about 70 per cent., in Boston 75 per cent., throughout the whole of Massachusetts 64 per cent., in New Haven 50 per cent. In rural counties like Rutherford and Williamson, where domiciliary confinement is more common, the maternal mortality rate seems to be unusually low, although the figures are so small as to be liable to great fluctuation. Incidentally it may be mentioned that 25 per cent. of confinements in Williamson County are conducted by midwives—a high proportion as compared with New York State, for instance, where there are only about 200 midwives: their number is falling, and the percentage of midwives' confinements among the white and coloured populations were respectively 1.7 and 3.3 in 1934.

S. Sen and K. C. Chaudhuri (*Indian Journ. Pediat.*, July, 1936, p. 161), who record three typical uncomplicated cases in native children aged 2½, 6, and 8 years in Calcutta, state that it is generally believed that scarlet fever does not occur in tropical or subtropical countries. Several cases, however, have been reported in India. The first authentic cases were recorded by Bosi in 1889, and since then Patel described a series of cases in Bombay in 1932 and Chaterjee three cases in a family in 1934. The writers are of opinion that scarlet fever is an indigenous disease of India occurring sporadically and not in epidemic form.

British Medical Journal

SATURDAY, OCTOBER 10th, 1936

PROBLEMS OF POPULATION

Professor A. M. Carr-Saunders is an indefatigable contributor to the literature of demography. His latest work, *World Population*,[1] exhibits his characteristic virtues and defects. Those readers professionally interested in statistics would probably reckon among defects a tendency to underestimate the original contributions of official writers and scientific students and to overestimate those of mere popularizers, while most readers will doubt whether the more prosaic type of Civil Service minute is a good literary model. Minutes have their virtues, but vividness is not one of them. These defects are, however, far outweighed by an intellectual impartiality and emotional control rare in those who discuss such controversial matters. Professor Carr-Saunders ranges from the history of populations through birth control to racial animosities and colonial policies. Nearly all are matters over which men differ to the point of fighting, yet he has not written a word in anger. He is, for instance, led to conclude that the policy of the Italian Government is to do what it can—which may not be much—to encourage over-population and at the same time to adopt, on the ground of over-population, a colonial policy which could not possibly relieve it. That conclusion does not provoke him to scorn or prevent him from trying to rationalize arguments he condemns. Indeed, it may well be unjust to condemn his Civil Service English ; perhaps that pedestrian style is the defence mechanism of one aghast at human folly.

Within our limits we cannot properly examine even one of the topics impartially described. But a few remarks upon one of them will suggest the interest of the whole. Hardly anyone doubts that the dwindling natural increase of this country is primarily due to birth control. Most people shrug their shoulders or refer optimistically to the declining death rate. The existence of the group, as distinguished from the aggregate of individuals forming it, is not affected by changes in the general death rate. Whether the group shall increase, be stationary, or dwindle depends practically upon the replacement of married women aged 15 to 45 in successive generations. If 1,000 of such women bring forth a number of female children such that when the survivors of these reach puberty and marry we have again 1,000 potential mothers, the group will be steady ; if more or fewer potential mothers come into existence, the group will expand or diminish. The reproduction ratio in this sense of England and Wales in 1933 was about 0.734 ; in 1921 it was 1.087. In Germany in 1933 it was 0.7. In Bulgaria it is 1.3. If both fertility and mortality rates were stabilized at the 1933 level, then, according to Charles's calculation, the population of England and Wales would reach its maximum in 1943, and be under 20 millions by 2035. If both fertility and mortality declined as during the last ten years, the population will already have fallen to 31 millions by 1975, and will be under 5 millions in 2035. Of course, it is not suggested that this last result is likely, but the interest of the calculation is seen in the fact that even on this hypothesis the movement is at first quite slow, the analogy is with compound interest. In 1940 the population would be rather larger than it is now ; even in another generation, in 1975, it would be over 30 millions. Then the decline would be swift. In other words, the decrease of population will not be dramatically obvious until it is almost impossible to stop it.

Professor Carr-Saunders has given careful attention to the means of arresting the decline of population which have been tried or suggested. All those which have been tried in civilized states have failed or are likely to fail. The German experiment of marriage loans has apparently been followed not only by more marriages but by more children, yet, as Professor Carr-Saunders notes, it is by no means clear that fertility has been affected. It may simply be that the interval between marriage and first birth has been shortened. Naturally if a family is limited to, say, two children, whether they are produced within two or ten years makes no difference to the replacement problem. As medical men, we may contribute something to delay the decline. There is still some room for improvement in mortality rates at ages under 45. There is scope for diminishing the risk of child-bearing, although here Professor Carr-Saunders, *mirabile dictu*, is more confident than most of us would be that it is simply a matter of spending more money and time on the problem. But, as citizens as well as medical men, we shall not be optimistic. With practically no exceptions the birth rate dominates the rate of natural increase. The countries of high birth rate are almost all countries with high death rates. As infant mortality must always be relatively high, that is partly a mere corollary. But not wholly. Just as, to compare small things with large ones, Topley and Greenwood pointed out that the size of a herd of mice recruited only by immigrants is dominated by the accession rate, so it is with human populations. It is not at all likely that the more "primitive" European peoples will long escape birth control.

The evidence collected by Professor Carr-Saunders on the whole weakens the sensational fear—which almost alone has newspaper publicity value—that one European race will, through population pressure, overrun another. It does not even paint the "yellow peril" in glaring colours. It is even more sombre. There seems, indeed, no intellectually convincing reason why European civilization should not peter out. Of course,

[1] *World Population. Past Growth and Present Trends.* By A. M. Carr-Saunders. London: H. Milford, Oxford University Press. (12s. 6d.)

in theory, much can be done. In practice, it seems, hardly anything will succeed. The inevitable gradualness of the change is the fundamental difficulty. After all, much more dramatic evidence of disaster has been ignored and is almost forgotten. There is no doubt that the harm done to civilization by the war of 1914–18 immeasurably exceeded any immediate or remote good coming out of it. Yet there appear to be millions of people in Europe who look forward to another war with confidence, if not with pleasurable anticipation. There are also in all countries men of great intellectual ability who have worked for years to render another war impossible ; yet they all admit failure. As the world did not learn the lesson of 1914–18, it is unlikely to be alarmed by such things as replacement ratios until it does not matter whether it is alarmed or not. That is one of the lessons to be learned from Professor Carr-Saunders's book. There are many others, such as that of colonization, not more dramatic but perhaps more immediate.

COMPENSATION FOR WEIL'S DISEASE

Before the Workmen's Compensation Act, 1906, if a workman died or was disabled by disease he or his dependants could only gain compensation if they could prove that the disease was caused by accident. It soon became recognized that certain diseases were so closely connected with industry as to be equivalent to industrial accidents, and the Act of 1906 therefore laid down that a workman who was disabled or suspended from his employment through catching any of a scheduled list of diseases owing to the nature of his employment could claim compensation, and his dependants could claim if he died. The list of diseases had been considerably extended during the last thirty years by various Home Secretaries under the power given them by the Act and its successor of 1935, Sections 43 and 44. If, however, a workman can show that a disease not in the schedule is due to an accident —which means in practice that he caught it at work— he can claim compensation under the ordinary provisions of the Act. During the last ten years a considerable number of workmen have claimed and been awarded compensation for injury caused by Weil's disease, or spirochaetosis icterohaemorrhagica. The leptospira which causes the disease is carried by sewer rats and reaches man through their urine. It will only live in moist conditions, and workmen are usually infected in such places as mines, sewers, fish-cleaning premises, farm middens, piggeries, and slaughter-houses. A large quantity of literature on the disease has appeared in this and other medical journals during the last few years. In July, 1935, the Home Secretary appointed a Departmental Committee to decide whether Weil's disease should be added to the industrial diseases scheduled under the Workmen's Compensation Act, and it submitted its report[1] in July this year.

[1] Third Report of Departmental Committee on Industrial Diseases. London: H.M. Stationery Office. 1936. (Pp. 16. 4d.)

The committee found that a recent and acute infection can be diagnosed either serologically by a high or ascending titre, or bacteriologically by demonstrating the leptospira in the blood or urine, directly or by animal inoculation. It is difficult to prove that death is caused by the disease, because the changes found after death are not specific ; moreover, a patient may die in the second week, before material for laboratory examination has been obtained. Nevertheless, the committee is satisfied that it is possible to be reasonably certain that death was caused by the disease if the claimant can show morbid changes compatible with it, an appropriate history and clinical picture, and the absence of any other recognizable cause of death.

The test for whether a disease ought to be scheduled is that it should be outside the category of accidents and diseases already covered, it should incapacitate for more than three days (the minimum period for which compensation is payable), and it must be so specific to the employment that the causation of the disease by the employment can be established in the individual case. The committee concluded that Weil's disease ought to be added to the schedule, but only with certain reservations. It found no difficulty in the first two parts of the test, and on the third it found that the disease is comparatively rare and the circumstances in which the applicant has been exposed to infection will usually have been confined to his occupation or can be ascertained with fair certainty. The committee points out, however, that later knowledge or a change in conditions might make it desirable to take the disease out of the schedule again. It recommends inclusion of the disease now provided that the Secretary of State's order requires the diagnosis to be confirmed by bacteriological or serological examination. The certifying surgeon (unless the employer admits liability) should be required to certify that the workman is suffering from infection by *L. icterohaemorrhagiae* confirmed by bacteriological or serological examination. Under the Act the certifying surgeon must examine the workman personally, but the committee considers that it should rest with the workman or someone acting for him to produce the laboratory evidence in support of his application. In practice the certifying surgeon would often communicate directly with the workman's medical attendant or the hospital authorities, and when necessary explain that the Act does not give the right to compensation without this evidence. If he should find that tests have not been positive or are not going to be made, he should explain the position to the workman and issue a certificate of refusal to certify. This communication with hospital authorities and others differs in no way from the present practice of certifying-surgeons when they are asked to certify skin cancer and anthrax. When a workman is dead, the committee adds, it will not be practicable to insist on this confirmatory evidence, as it will hardly ever be available. The report recommends that the dependants shall have a right to compensation without it, but that if the employer contests the application they will have to produce sufficient general evidence to justify the court

in concluding that the death was caused by the disease. The second column of the schedule to the Act contains the names of processes which raise a presumption that a disease contracted in them is due to the nature of the employment. There are several non-occupational sources of Weil's disease, and its incidence in any particular class of workman is small, so the committee does not recommend that any processes should be named in that column.

PROPHYLAXIS OF DIPHTHERIA

Diphtheria still kills far more children than it should, for all serious observers agree that modern prophylactic inoculation can control the disease. The identification by McLeod of the main types of the bacillus in different epidemics will in time, it is hoped, help the administrator in controlling the disease if he is alive to the introduction of new strains of bacillus into his area, and the immunologist should produce ever more potent prophylactics. The useful international inquiry carried out from Paris[1] yields no clear conclusions on epidemiology: in certain countries—for example, England, Rumania, and Japan—there was an increase in some recent years; in other countries there has been a decrease. Even a student of the salutary Topley-Greenwood criticism of results claimed from prophylactics cannot resist the conclusion that active immunization notably reduces the incidence of the disease. In different groups of figures the incidence among the vaccinated is many times less than among roughly comparable groups of unvaccinated. All this has been said before and often; to-day one asks what is the best method of immunization and to what extent are the reputed "failures" of immunization being fruitfully investigated Deaths among inoculated children or those naturally negative to the Schick test are unknown or rare; attacks of the disease in these patients are often caused by unusual types of bacillus, and where the bacteriologist supplies this information relative to an outbreak among a group of nurses or the inhabitants of a special area the strong indication is that by a repetition of immunization the danger will be overcome. At the International Congress of Microbiology in London in July stirring figures of reduced incidence were presented by Fitzgerald of Canada, W. H. Park of New York, and Johan of Budapest. To decide which is the best method of immunization calls for considerable circumspection, and the wise man will wait a while. Canada, with its splendid record of reduced incidence, at present trusts in formol toxoid, as do France and other parts of Europe. In the reports from large areas of U.S.A., Hungary, Denmark, and England, the precipitate of alum toxoid is being mentioned more and more frequently. Fitzgerald prefers toxoid to alum toxoid; Park's figures support the contrary view; yet, oddly enough, New York City has decided recently to cease the issue of alum toxoid.[2] As pointed out by Chesney and by Parish in England, it is wiser where conditions permit to use two spaced injections of alum toxoid than the much heralded "one-shot" method. One small but important observation in a "self-contained area" in England by Chesney suggests that even in a population with the exceptionally high natural Schick-positive rate of about 70 per cent., the use of a small dose of alum toxoid, followed by a larger dose a few weeks later, provides a practicable, safe, and highly efficient means of achieving the end in view, for 299 of Chesney's 300 positive children became negative to the test within two months. It is interesting that, very rarely, a patient is met with who, after immunization, previous test, or infection with diphtheria, is sensitive to Schick toxin, and shows symptoms of allergy shortly after injection. These are generally mild, and in the very few instances of severe reaction reported the condition has been controlled with adrenaline. British readers are always interested in compulsion in other countries: so far as we can find, outside the three European autocracies, immunization is compulsory only for contacts in Egypt, and in 1937 will be made compulsory for certain age groups in Hungary as a result of the convincing figures obtained by Johan, Tomcsik, and their staff. In England and America diphtheria prophylactic and scarlet-fever toxin are often given together. Where the people at risk are under administrative control—for example, in conscript armies—the method of multiple simultaneous immunization elaborated by Ramon[3] may be serviceable; thus diphtheria formol toxoid (anatoxine) may be given together with either T.A.B. vaccine or tetanus toxoid.

[1] *Bull. Off. Internat. d'Hyg. Publique*, Supplement, February, 1936.
[2] *Health Quart. Bull.*, August, 1936.

ETHER CONVULSIONS

Ether convulsions were first described in 1927. Since that time there have been numerous references in this *Journal* to the condition, and it has formed the subject for discussion at meetings. The causation of the convulsions, however, still remains obscure, and anaesthetists are not yet in complete agreement as to the correct treatment. In two recent papers further light has been shed on this unfortunate complication of a surgical operation. Hoseason,[4] in discussing the pathology, suggests that a temporary derangement of calcium metabolism occurs under ether anaesthesia and that a condition allied to tetany is produced. He describes the case of a woman who developed convulsions during an operation for ruptured ectopic gestation. The anaesthetist hastily gave an intravenous injection of calcium gluconate and the convulsions ceased almost immediately. Calcium is well known as a means of checking neuro-muscular irritability, and Hoseason suggests that the reason why evipan and nembutal have been successful in the treatment of ether convulsions is because of their powerful depressant action on the neuro-muscular mechanism. In the second paper Hudson[5] describes two cases, in the first of which intravenous calcium was given without effect and the patient died. The second case is of unusual interest in that the patient, a marasmic infant, developed typical convulsions while being operated on for hernia under local anaesthesia. Hitherto there has only been one constant factor in all the cases reported—namely, the presence of ether. The convulsions were successfully controlled by the administration of

[3] *Rev. Path. Comp.*, 1936, p. 792.
[4] *Brit. Journ. Anaesth.*, July, 1936, p. 142.
[5] Ibid., July, 1936, p. 148.

chloroform and the patient made an uneventful recovery. Hudson suggests that the precipitating cause of the convulsions is a powerful surgical stimulus to a patient who is not deeply enough anaesthetized to stand it. Evipan and chloroform are therefore of value in treatment because of the profound narcosis they produce in a short space of time. Possibly both these observers are correct and the causes of ether convulsions are twofold: first, a predisposing cause in the nature of a biochemical change ; and, secondly, a precipitating cause—the painful stimulus of the operation on an insufficiently anaesthetized patient. Intravenous calcium may combat the first and evipan or chloroform the second.

PROTAMINE-ZINC-INSULIN

The discovery of protamine insulin by Hagedorn and his colleagues was an important advance in the therapeutics of diabetes ; an insulin compound had been found in which insulin action was retarded and prolonged. Hard on the heels of the original discovery modifications have appeared, and for each further advantages are claimed. The last of these, whose clinical trial is reported, is protamine-zinc-insulin. It has long been known that the pancreas contains particularly large quantities of zinc, and following up this clue D. A. Scott[1] was able to show that this metal was apparently a normal constituent of insulin. He also demonstrated[2] that the physiological action of protamine insulin was influenced by the amount of zinc present, the depressant action on the blood sugar being retarded and prolonged as the proportion of zinc increased. These observations on animals naturally led to the clinical study of the action of protamine insulin in combination with zinc, and a report on this has recently been published by Rabinowitch[3] and his co-workers. Rabinowitch brings forward evidence that, as compared with protamine insulin, protamine-zinc-insulin has a more prolonged action, permits a more effective control of the diabetic's blood sugar, and can be administered in smaller doses. Easier avoidance of hypoglycaemic reaction is an advantage the new compound has in common with protamine insulin, but in its efficacy in the treatment of diabetic ketosis it is said to possess an action rivalled only by ordinary insulin. Rabinowitch asserts, further, that the new compound is more efficient in controlling the plasma cholesterol, aids liver function, and is probably beneficial in diabetic neuritis. The evidence upon which these latter assertions are based is not of a character which can be critically accepted. When a diabetic is transferred from ordinary insulin to protamine insulin, hyperglycaemia and glycosuria usually appear, but in the course of a few days, without increase of the dose of protamine insulin, the blood sugar falls within normal limits and glycosuria disappears. With protamine-zinc-insulin it is claimed that the transfer from treatment with ordinary insulin may be effected without this temporary derangement, and the explanation offered is that the zinc increases the sensitivity of diabetics to insulin. This conclusion is somewhat difficult to reconcile with further work referred to in the same paper, which not only confirms on diabetics Scott's observations on animals—that zinc retards and prolongs the action of insulin—but also claims to show that zinc may actually inhibit the action of insulin and render the diabetic insensitive to it. This contradiction is followed by speculations resting on the idea of an inhibitory action of zinc, but in support of such views no experimental evidence is adduced. It is unfortunate that the majority of the observations in this report have been carried out upon a special group of diabetics termed " insulin wasters," for such a selection of cases inevitably raises a doubt whether the results on these patients are applicable to diabetics in general. Probably the results may be regarded as of general rather than of limited application, since it appears that such patients are clinically no more than cases which are difficult to balance, and that the term " insulin waster " relates to a more or less speculative explanation of this difficulty. The general impression left by the paper is that, although protamine-zinc-insulin is almost certainly a therapeutic agent of considerable value, Dr. Rabinowitch in claiming for it all possible advantages has failed to establish a clear title to most of them.

[1] *Biochem. Journ.*, 1934, xxviii, 1592.
[2] *Journ. Biol. Chem.*, 1936, lxxxviii, 114.
[3] *Canadian Med. Assoc. Journ.*, 1936, xxxv, 239.

WHITE BILE

Beyond a recognition of the grave prognostic significance of colourless or so-called white bile in cases of obstructive jaundice, little has been known as to its origin and the factors responsible for its appearance. The bile characteristic of obstructive jaundice is thick and of such a dark colour that it might with accuracy be described as black bile. Why, then, in some cases is this black bile replaced by white bile, and why is the outlook for the patient thereby materially changed for the worse? White bile is found in certain toxic conditions—for example, in phosphorus poisoning and as a rare condition at birth in certain cases of congenital deficiency of the cells of the liver, but these examples are of academic interest only ; the variety with which surgeons are concerned is that met with in the common bile duct in some cases of obstructive jaundice. Courvoisier in 1890 was the first to give an enlightening description of white bile and to point to the different significance between the white bile confined to the gall-bladder in some cases and that found throughout the ducts in others. Some idea of the frequency with which this condition appears may be gathered from Judd's statistics reported in 1923 from the Mayo Clinic. At 649 operations performed on either the common hepatic or the common duct, white bile was found in the ducts in nineteen. Much experimental work has been done, particularly in America, and many hypotheses have been advanced to account for its production. The most recent contribution comes from Hans G. Aronsohn[1] of Chicago, who has studied the question from experimental, clinical, and historical aspects. He points out, as did Courvoisier, that the colourless contents of the gall-bladder in a case of mucocele or hydrops cannot be compared with " white bile," because in the first instance the system is a closed one and the gall-bladder bile can be affected only by the gall-bladder wall, whereas in common-duct obstruction the bile in the ducts may be affected not only by the walls of the duct

[1] *Arch. of Surg.*, 1936, xxxii, 1055.

but also by the secretory cells of the liver. Two factors appear to be necessary: first, obstruction to the common duct ; and, secondly, infection of the retained bile. Aronsohn has been able to produce white bile by injecting bacteria into the experimentally obstructed biliary system. In common with others who have studied this subject he suggests that the decolorization in the presence of infection is the result of absorption of the bile pigments by phagocytic leucocytes which have appeared in response to the infection. Some small part of what we know as white bile may arise as a secretion from the bile ducts, but the bulk of it is bile which has been retained as a result of duct obstruction and which has been infected and subsequently decolorized as a result of leucocytic activity.

SMOKE ABATEMENT EXHIBITION

The Smoke Abatement Exhibition, which will remain open at the Science Museum, South Kensington, until October 31st, illustrates the nature and effects of the pollution of the atmosphere by coal smoke, the methods of measuring smoke and pollution, and the means made available by science for reducing both. The exhibits, which are well arranged and lucidly described, comprise models, specimens, photographs, charts, and diagrams. Among those illustrating the effects of smoke are striking aerial photographs of industrial towns, specimens of soot-encrusted stone and brick, four lung preparations showing the effect of atmospheric pollution on these organs, and samples of white linen before and after twenty-four hours' exposure to the air of Manchester. In the section devoted to measurement of smoke and pollution a model illustrates the ingenious method by which the density of smoke in a factory chimney is measured. A beam of light projected across the chimney through the smoke falls upon a photo-electric cell. The current through the cell is proportionate to the amount of light falling upon it, and the smoke density is automatically recorded on a dial within the factory. In the abatement section are models of houses smokelessly heated by gas and coke, and by electricity. An excellent handbook on sale at the exhibition (price 6d.) contains, in addition to a description of the exhibits, a series of articles by expert contributors on different aspects of the smoke question. In " The Effects of Smoke on Vegetation " is an interesting table showing observations on privet. Bushes three miles north of Leeds remain evergreen and bear flowers. Two miles north no flowers are borne, and one mile north few leaves are retained through the winter. In the centre of the city all leaves fall in January, while in the industrial part they fall in November. In " Smoke and Aviation " allusion is made to the dangers which fog still causes to aircraft, despite directional wireless control, and to the hours of instructional and commercial flying lost through impaired visibility. Of most interest to medical readers, however, is the article on " Smoke and Health," contributed by Lieut.-Colonel Langrishe, lecturer in public health at Edinburgh University. He cites as examples of direct effect the increase in death rate from respiratory diseases in Glasgow from 2.1 to 13.9 per 1,000 coincident with severe smoke fogs in the winter of 1909, and the three-day fog in the Meuse Valley in Belgium in December, 1930, which caused the death of sixty-five people and numbers of cattle. At the London Zoological Gardens the pathologist has often found necrotic foci localized around carbon deposits in the lungs of birds which have died in the aviaries. These foci have been colonized in many cases by tubercle bacilli. Indirect effect arises from the cutting off of solar radiation, and from the action on vegetation. Where pasturage in industrial Lancashire supported two cows to the acre as recently as thirty years ago, one animal now needs three acres. With the lime content in the soil reduced, milk from such cows is deficient in calcium ; also in vitamins through lack of sunlight. Thus the young children in these areas find their staple diet of poor quality. The Smoke Abatement Society is a voluntary organization, whose work should appeal to doctors, especially in industrial areas. The annual subscription is half a guinea ; particulars may be had from the secretary, 36, King Street, Manchester, 2.

INTERNATIONAL LEAGUE AGAINST EPILEPSY

On Friday, October 16th, the first annual meeting of the British branch of the International League against Epilepsy will be held in the rooms of the Medical Society of London, 11, Chandos Street, W. Since the inauguration of the parent society just over a year ago national branches have been already instituted in Great Britain, the U.S.A., Holland, and Scandinavia, and branches are in the process of being organized in Germany and in the Irish Free State. The objects of the league are to co-ordinate the activities of those interested in the better care and treatment of epileptics, and to stimulate interest in the social and scientific aspects of the disease. Business will begin at 10 a.m., and between the morning and afternoon sessions there will be a luncheon at Pagani's Restaurant. Those reading papers include Drs. Douglas McAlpine, Russell Brain, Gwenvron Griffiths, Mayer-Gross, Norwood East, Frank Schneider, Helen Murray, and others. Among the topics to be discussed are epilepsy in its relationship with crime and delinquency, and the hereditary aspects of the disease, with special reference to the recent German work on this problem. Any medical practitioner interested should communicate with the temporary secretary, Dr. Macdonald Critchley, 137, Harley Street, London, W.1.

Sir Leonard Hill, F.R.S., has been awarded by the Royal Society of New Zealand the T. K. Sidey Summertime Memorial medal and prize for 1936. This award, which consists of a gold medal and a hundred pounds in New Zealand currency, is made to the person who in the opinion of the council of that Royal Society has made a valuable contribution to human knowledge by original research into the effect of light and solar radiations on human comfort. It was instituted in commemoration of the passing of the Summertime Act through the New Zealand Parliament, a step in which Sir Thomas Kay Sidey, who gives his name to the award, was largely instrumental. The Sidey Summertime award is not given annually, but only at intervals when sufficient funds have accumulated. The first and only other recipient of the honour is another eminent English scientist, Lord Rutherford of Nelson.

HEALTH OF THE ROYAL NAVY

REPORT FOR 1934

The report on the health of the Navy[1] for 1934 contains some highly satisfactory statistics. The death rate of 1.68 per 1,000 is the lowest ever recorded, while the incidence of disease and injury, the invaliding rate, the average of daily sick, and the total number of days' sickness all show a decrease, not only on the 1933 figure but also on the average for the previous five years.

Remarks on Diseases

Only one case of beri-beri is recorded. The patient was a boy of 17, serving in the Mediterranean after a West Indian cruise; no dietetic cause was discovered. There was an increase in the incidence of diphtheria, but the majority of cases were among men serving on the Home station, and the rise must be attributed to increased incidence among the civilian population. Of the fifty-three cases of dysentery, the majority occurring on the China station, there were twenty-seven amoebic and eight bacillary infections among the thirty-five new cases. In treatment of amoebic dysentery carbarsone has been introduced to replace emetine-bismuth iodide, and emetine followed by carbarsone has given excellent results. Of five cases of enteric fever two were serving on the Home station; both had been previously inoculated, one eighteen months and the other thirty-two months before contracting the disease. The remaining three cases, all having been inoculated within fifteen months, occurred in the Mediterranean and were of mild type. The suspected areas of infection were Seville, San Remo, and Navarin. Influenza showed a remarkable decrease on the previous year with a total of 629 as against 3,770. In H.M.S. *Dauntless*, at Malta, there were sixty cases in an outbreak which began and ended with remarkable suddenness in the month of November. Other ships on the station were practically unaffected. It is noteworthy that during the previous year, when influenza had been prevalent in the Mediterranean Fleet, the *Dauntless* had been on the West Indian station, and there had, in fact, been no case of influenza in the ship since 1932. Two cases of kala-azar are recorded from the Home station, following service in the Mediterranean. Both showed marked anaemia and splenic enlargement, and both recovered under treatment by urea stibamine intravenously.

Malaria and Small-pox

The number of cases of malaria was 255, an increase of forty-five over the previous year. No deaths or invaliding resulted. This rise was accounted for principally on the East Indian station, where in one cruiser alone there were forty-nine cases. The majority of benign tertian cases occurred at Colombo and Trincomalee, and of malignant tertian at Dar-es-Salaam. It is stated that at Hong-Kong treatment by atebrin followed by plasmoquine has been found superior to quinine therapy.

There were six cases of small-pox, with one death—a young seaman at Hankow contracting the confluent form of the disease. He had been revaccinated twice in the course of the previous year with negative results. Four of the remaining patients were in the sloop H.M.S. *Lupin*, operating in the Persian Gulf. Following three cases among Somali ratings the surgeon lieutenant himself became infected. He was evacuated by air to the R.A.F. isolation hospital at Basrah, spending a night in the desert *en route* on account of a forced landing. In this outbreak it must be noted that two of the Somalis had a previous history of small-pox, and that all the patients had been vaccinated within the preceding two years. In each case the symptoms were mild.

Schistosomiasis Japonicum

Twelve ratings from a river gunboat were infected with this disease at Chinkiang on the China station. Although cases arise from time to time among officers who have been shooting duck and snipe in the rice fields, infection among ratings is rare. In this case the men had been bathing while the ship was anchored 300 yards from shore in five fathoms of still tidal water. Of seventeen bathers twelve were infected, this pointing to a very high concentration of cercariae. Subsequently snails of the genus Oncomelania were found in abundance in the neighbourhood of the anchorage. After this outbreak bathing in rivers and valleys was forbidden, except in certain specified places. The average incubation period of the cases was six weeks. Half were treated with intravenous sodium antimony tartrate and half with intramuscular fouadin (Bayer). It was found that the former drug was more destructive to the worms and their ova, and that it caused less discomfort and mental depression. On the other hand, fouadin relieved the early acute symptoms more promptly.

Injuries

One hundred and thirty-two persons sustained general injuries, which caused fifteen deaths. Of the latter, five were due to motor accidents and seven to drowning. During this year there were no fatalities from multiple burns and scalds. One death was due to asphyxia from suffocation as a result of compression of the thorax. In this case a man was washed under a boat by a heavy sea breaking inboard. The force of the water had lifted up the boat, which fell back into position, pinning the man underneath. Local injuries numbered 6,654, including 334 burns and scalds. One case is of special interest. A connexion in a high-pressure oil pump broke, and, to prevent damage to the machinery, the patient placed his finger over the broken end. The pressure of 650 lb. to the square inch actually forced oil into the tissues. Gangrene supervened, and it became necessary to amputate the distal half of the finger. Of nineteen deaths from local injuries fourteen were cases of fractured skull. The majority of these were caused by motoring accidents. One was due to diving into shallow water, one to a revolving aeroplane propeller, and one to a fall from a roundabout at a fair. Fracture of cervical vertebrae was the cause of death in another diving mishap, and there was one death from gunshot wounds, the victim being shot by Turkish sentries while boating.

Special Departments

Under the section of hygiene and preventive medicine it is stated that there has been no case of scarlet fever at the Royal Naval College, Dartmouth, since January, 1933, although the disease had been prevalent in neighbouring towns and villages. In February, 1933, Dick-testing and, where necessary, immunization were instituted. At that time the proportion of susceptible cadets was about 64 per cent., and there had been fifty-five cases in the College from 1928 to 1932. A protected community had now been built up. Despite the larger doses and the more intensive nature of the courses of immunization, only five general reactions were recorded out of 568 injections.

This report, dealing as it does with material of the greatest interest, resembles those of the Army and the Air Force in the inaccessibility of the information. In this respect it compares unfavourably with most municipal medical reports. Since no index is provided, a laborious search was necessary in order to find statistics—for example, of appendicitis, and duodenal ulcer—which are only given in the tables devoted to individual fleets and stations; in the tables dealing with the whole force they are not classified as separate entities.

[1] *Statistical Report of the Health of the Navy for the Year 1934.* London: H.M. Stationery Office. 1936. (2s. 6d. net.)

D. A. Coletti (*Il Policlinico*, Sez. Chir., June 15th, 1936, p. 243), who records two personal cases in men aged 56 and 75 respectively, illustrates the rarity of primary perforating ulcer of the jejunum by the fact that up to 1925 only ten cases of the kind had been collected by Jancke, while from 1927 to 1932 Ebeling could find only forty-seven cases of primary ulcer of the jejunum on record. The diagnosis before perforation is difficult even after radiological examination, but is easier after perforation has taken place. Both Coletti's patients recovered after operation, which in one case consisted merely in excision of the ulcer and in the other of entero-entero-anastomosis.

OPENING OF NEW SESSION

WESTMINSTER HOSPITAL

ANNUAL DINNER

The first of the autumn dinners of the London teaching hospitals was held on Saturday, September 26th, when old students of the Westminster Hospital dined together at the Trocadero Restaurant. It was a particularly happy occasion, the pleasure of those assembled deriving from two sources: the fact that the guests of the evening included such distinguished persons as Lord Horder and Major-General W. P. Macarthur, and the presence in the chair of Mr. TUDOR EDWARDS, so recently recovered from a severe illness.

Proposing the toast of "The Medical School," Mr. Tudor Edwards reviewed some of the events of the last twelve months. The present site of the hospital, he said, had been sold for £330,000, a sum, he could now reveal, which exceeded expectations. The buildings of the new medical school were taking shape, and the funds for their completion now stood at £42,000, leaving a further £11,000 to be provided. He appealed to those present to reduce or, better, to eliminate that deficit. The work of the school was increasing. This year there were 176 students, or about double the number ten years ago, but with this increase in quantity there was no diminution in quality. The chairman concluded with words of congratulation to Dr. Arnold Stott on his appointment to the Royal Household. Brief responses were made by Dr. JOHN DAVIES, whose ready wit delighted his hearers, and Mr. N. F. COGHILL, who reviewed the School's activities in various fields.

Dr. ADOLPHE ABRAHAMS, proposing the toast of "The Guests," said that one of his youthful dreams had been of proposing such a toast as that of the eminent physician Lord Horder. But nothing happened as it was expected to happen, and the dream of youth had given way to a tongue-tied aphasia. Despite this "aphasia," however, Dr. Abrahams paid eloquent tribute to Lord Horder and General Macarthur in a speech replete with anecdote and reminiscence. Lord Horder, he said, was the most popular of lecturers: students realized that they were learning at the feet of one of the best teachers this country had ever produced. Lord HORDER, in reply, said that when he received the invitation to dine with old students of Westminster Hospital, he thought the fact that he was giving the inaugural address to the School on the following Monday would render him immune from service as a speaker that night. But his suggestions to that effect had been unavailing. In acknowledging Dr. Abrahams's reference to his students, Lord Horder said he was glad to see some of his old pupils there. He grouped his students into three classes: (1) those who advertised the fact; (2) those who concealed the fact; and (3) those who admitted it under stress of circumstance. Major-General MACARTHUR expressed appreciation of the Dean's speech, which was, he said, "a true reflex of his kindly nature." Westminster Hospital was adding cubits to its stature in providing increased facilities for clinical and research staff. Dr. ARNOLD STOTT proposed the health of the chairman, who, he said, had achieved so much in thoracic surgery that it looked as if one day "double pneumonectomy" might be a common operation, or else there would be discovered another system of the body which contained air. Mr. Tudor Edwards's international reputation brought great honour to the School, and they all hoped he would attain even greater heights. With the chairman's reply the proceedings closed.

The Inaugural Address

In his inaugural address to the students on Monday, September 28th, Lord HORDER discussed the relation between doctor and patient. The patient was to be protected, he said, not only against death, if that was possible, and pain, but against the quack who would batten on his infirmities, against his friends, and too often against himself. Once his bona fides was established and he had entered the consulting room of the doctor's personality (not merely the doctor's house), the patient had a right to the utmost that the doctor could give him—his brains, his skill, his experience, his wisdom, his time, and his physical and mental comfort. There must be no thought in the doctor's mind of who the patient was or what he was. There was much good in all the instruments of precision that were introduced from time to time, in the elaboration of bacteriological and biochemical methods, and in the rapid sequence of new machinery in physiotherapy; but if we were not careful they would replace the essential factor in the diagnosis and treatment of disease—namely, the personal contact of doctor and patient. The faith of the patient in a piece of apparatus was pathetic. Instrument makers dictated standards, and there were those who adopted a doctrinaire attitude towards diet which seemed to make a great appeal to many patients. It was the doctor's business to counter all this, and to reveal the patient to himself. His whole duty was to examine carefully, explain clearly, instruct hopefully, and watch diligently.

ST. GEORGE'S HOSPITAL

ANNUAL DINNER

The St. George's Hospital Medical School dinner was held at Claridge's on October 1st, with Dr. HAROLD SPITTA, honorary bacteriologist, in the chair; and among the guests in a large company of old students and staff were the joint treasurers of the hospital, Lord Greville and the Earl of Winchilsea. The toast of "The Hospital and Medical School" was proposed by the chairman, who remarked that there was no time or place in these days for inefficient people; tradition was a great thing, but it must not impede progress. The problem of rebuilding St. George's was in the minds of them all, and courage, foresight, and vision were needed. One difficulty was that no building could be put up at Hyde Park Corner unless it complied with rigorous conditions. Thanks to the treasurers, negotiations had been successfully completed. The medical school would be an integral part of the hospital, built into it, with a number of new departments, including psychiatry and industrial medicine. The raising of a separate fund for the new medical school was in the able hands of Dr. Torrens and Mr. Frankau. "If you want a thing done," Dr. Spitta said, "ask a busy man, not idle people who busy themselves about nothing." St. George's, he said in conclusion, was a small but very important medical school, with most distinguished alumni, and its tradition must be maintained and enhanced. Mr. IVOR BACK, in reply, said that at this October family party the dean, in the ordinary way, should have responded to the toast. This year, however, the office of dean was changing hands, and it was his privilege to wish Mr. Nicholls all success in following Dr. Anthony Feiling, who had now retired after ten years in that arduous post. Dr. Feiling was looked upon by all the younger generation of George's men as their adopted uncle; he now passed on a flourishing school to his successor, and his colleagues were presenting to him a solid token of their regard in the form of a set of dining-room chairs. Mr. Back also paid tribute to the thought-giving inaugural address delivered that afternoon by Sir Crisp English, and to Dr. Spitta's undeviating devotion to the interests of the hospital. Dr. FEILING, expressing thanks for the compliments paid him and the gift, said that his appointment to St. George's had been one of the most fortunate things in his life. He came as a stranger from the east of London to the west, and deeply appreciated the cordiality and generous wel-

come of the staff and students, whose loyalty to him had been an inspiration. Sir Crisp English, who proposed the health of the chairman, said that he and Harold Spitta joined St. George's on the same day, and both were proud of being sons of George's men. Dr. Spitta was in the chair that night because the staff wished to express gratitude for his fine work on behalf of the hospital appeal. His gift for getting money was well known ; indeed, there was no rich man in London who might not be the poorer for meeting Harold Spitta! The Chairman, in a brief acknowledgement, spoke of the stimulating address by Sir Crisp English, who throughout a very busy and prosperous life had never failed to give his best services to St. George's.

The Inaugural Address

Sir Crisp English's inaugural address on the afternoon of October 1st was intended primarily for the newly joined students. Touching on some of the principles and some of the points which made for success in the medical profession, he urged the supreme importance of looking forward as a habit. He impressed upon his hearers the need for having a particular plan or policy about the future. Some people might advise them not to bother until they got qualified, and then to look around for opportunities. This too often meant leaving the whole of a man's future career to haphazard chance. It was far better to make up one's mind early than to wait and see, and the higher the aim the better. In a reference to the true meaning of a profession Sir Crisp English insisted that it was a wholly wrong point of view to speak of medicine as a means of livelihood. Most people had to earn their living, but if they threw themselves heart and soul into their profession that living would come automatically. If a man became a doctor with the primary idea of making money he was a fool ; the years and the expense involved in his training, the amount of time and work he would have to give as a medical man, would in many other occupations bring him far more money. When a man qualified his outlook should be: What am I going to give to my profession, to medical science, and to my patients? The lecturer then turned to the subject of medical education.

"There is an enormous amount to be learnt which is not in the textbooks ; these books teach you about injuries and diseases, but little or nothing about the people who suffer from them. And yet it is essential for success that you should study and treat the individuals, not merely the bodies in which they happen to live. Textbooks are soon out of date ; the books of twenty years ago are absolutely of no use to you now, and equally the books of to-day will be quite obsolete in 1956. One curious defect in medical education is that, although most of you will go into general practice, you will have no instruction from general practitioners. We have to recognize the fact that we are still very ignorant about much, and that before us there lies a whole unconquered world of knowledge ; it is certainly true that many of the beliefs of to-day will become the fables of to-morrow. These are reasons why your education must continue indefinitely, why you must continually revise it and add to it if you wish to remain efficient. Yet post-graduate facilities in our profession are rudimentary, with certain well-known exceptions, such as the British Post-Graduate School. Unfortunately, medical schools as a whole take little interest after the passing of the final examinations ; they lack 'follow through': like the roadside taverns which offer you 'bed and breakfast' they appear careless as to what happens to you for the rest of your journey. One of the greatest fallacies of the age is the idea that schools and universities complete education ; actually they only begin it, for education is life-long. The time will most certainly come when medical men will demand and welcome full facilities for post-graduate courses and teaching, so that they may see the advances and new methods, and thus keep their knowledge up to date. What you will have to get firmly riveted on to your minds is this: each year must show a definite advance on the previous year ; advance in your knowledge, advance in your technique, and a better understanding of your fellow creatures. Never be satisfied ; work that you are satisfied with is dead, because it is not going forward. Like manufacturers of motor cars, you must produce a better model each year ; otherwise you fail: all the way through you must scrap what is out of date, scrap what is second-rate, and replace them with the newest and best. There is no standing still in this matter of education and knowledge: either you advance or you fall back."

The concluding part of Sir Crisp English's address was a forecast of the future conditions of medical practice twenty years hence, with special reference to the increasing attention that must be given to the preventive outlook. "Prevention will certainly come to be recognized as our first duty. This can only be carried into effect by the wide extension of public medical services on the lines suggested by the British Medical Association." He ended with advice on the wise employment of leisure hours.

CHARING CROSS HOSPITAL

ANNUAL DINNER

The annual dinner of past and present students of Charing Cross Hospital Medical School was held at the Café Royal on October 3rd, with Mr. Philip Inman in the chair. Proposing the toast of "The Hospital and Medical School," Mr. Inman said that optimism for the future was fully justifiable in view of the steady and marked progress of the school, and for this the thanks of all were due to the dean and secretary for their excellent work. He reviewed the factors in the present stability of the hospital and school, and added that no removal from the present site was contemplated. No amalgamation with any other hospital was under consideration. He warmly thanked Dr. Oxford for his contagious enthusiasm and for his devoted service, and paid tribute to others who had been unsparing in their labours for Charing Cross.

Mr. Norman C. Lake replied on behalf of the hospital. He stated that the idea of rebuilding and extending the institution was still being entertained. Among the many advantages of a small hospital was the close intimacy and co-operation possible between the students and the staff. There must always be an adequate supply of clinical material, and this was preserved for Charing Cross by its present situation, where it was greatly needed. The dean, Mr. E. A. Crook, mentioned that this was the first students' dinner which had been attended by Mr. Inman in his capacity as chairman of the hospital. He deeply regretted having to record the loss by death of the previous chairman, Mr. Verity, who had been a most devoted worker in association with Mr. Inman on behalf of the hospital, and had taken a special interest in the welfare of the school. There had been a large entry of new students, and even so a considerable number of applicants had had to be rejected, for it was felt most undesirable that there should be any overcrowding. It was particularly gratifying that so many sons of old Charing Cross men had entered as students, and the school as well as the hospital could be described as a very happy ship.

Dr. Gordon M. Holmes proposed the toast of "The Visitors" in a most appreciative speech. The Rev. Pat McCormick, chaplain to the hospital, remarking that on this occasion he did not require a microphone, responded in a speech which contained many pointed anecdotes. He emphasized the importance of clear speaking, and illustrated his admonitions. He hoped that the most welcome increase in co-operation between the clergy and the medical profession would be still more intensified in the future, for very much good could accrue thus to those sick in body as well as soul. Professor R. J. S. McDowall, who also responded to this toast, maintained that the average medical practitioner of ripe experience could have but little to regret when looking back over his previous years of life. Dreams were not always idle and useless ; it was good to dream of a future in which Charing Cross Hospital might function as a great central

institution for the hospitals of the metropolis. The intimate relationship of Charing Cross and King's College had brought many advantages, and would result in still greater good in the future.

The health of the chairman was proposed by Dr. A. W. OXFORD, who referred to his seven happy years as resident medical officer in his early sixties, and his many pleasant memories before and since. Mr. INMAN, replying, said that Charing Cross Hospital was looking forward to the future with high ambitions and intense confidence. There had been many difficulties in the past, but these had gradually been overcome. Future obstacles would doubtless be overcome in their turn, for the hospital and school were most happily united, and progress would consequently be maintained. Mr. Ronald Frankau entertained the party with his characteristic songs, and Mr. Cyril Shields gave a baffling display of sleight-of-hand performances.

On the afternoon of October 2nd the prizes to successful Charing Cross students were distributed by LORD ILIFFE, who in the course of his address drew attention to the need for better education of the public in matters of health and disease. While preventive medicine had made remarkable strides it was appalling that the members of a civilized community should be so ignorant on this subject. Much of the tragedy caused by sickness could be prevented by early diagnosis ; but the public, never having been taught, could not recognize the symptoms, or if it recognized them, was prone to accept the extravagant claims of the sellers of patent remedies. Hygienically, much of the public was in the bow-and-arrow stage of development. Enlightenment was needed to ensure far greater use of the knowledge and skill of the medical profession.

MIDDLESEX HOSPITAL

ANNUAL DINNER

The annual dinner of the Middlesex Hospital Medical School was held at the Savoy Hotel on October 2nd, and the company numbered 333. After the loyal toasts had been honoured the chairman, Professor JAMES MCINTOSH, director of the Bland-Sutton Institute, proposed the health of the hospital and medical school. Professor McIntosh alluded to two outstanding events of the year. First, a knighthood had been conferred on Sir Alfred Webb-Johnson, surgeon to the hospital, who had also had the honour of being appointed Surgeon to H.M. Queen Mary. The award of these distinctions had given great pleasure to his colleagues. Secondly, the Bland-Sutton Institute of Pathology had celebrated its majority. At the Middlesex great importance was attached to research work. It was the function of a medical school not merely to disseminate knowledge, but to strive to gather it. Only thus could progress be achieved. The Middlesex had been fortunate in its deans. Sir Alfred Webb-Johnson, Mr. Pearce Gould, Dr. Bennett, and Dr. Boldero successively had each found some special way of helping the hospital and medical school. In reply, Mr. E. W. MEYERSTEIN, vice-president of the hospital, spoke of the miracles performed in modern hospitals about which the public heard nothing. It was to be regretted that hospitals did not obtain a well-earned advertisement from such cases, even though medical ethics did not permit any mention of the name of the physician or surgeon concerned. Mr. Meyerstein deplored, with some justification, the partiality of the profession for employing, not always necessarily, terms unintelligible to the layman.

Dr. H. E. A. BOLDERO, dean of the Medical School, mentioned that, on the occasion of its centenary, the University of London had conferred the honorary degree of LL.D. on Mr. S. A. Courtauld, chairman of the council and a generous benefactor of the hospital. It had been necessary to limit the number of students in order that all might be adequately taught at the bedside. Extension of accommodation had, however, already been provided in the departments of physics, anatomy, and physiology, and more was to follow, while the generosity of Mr. Meyerstein had made possible further accommodation for residents. Mr. J. C. BONE, Senior Broderip Scholar, spoke as the representative of the students and recently qualified men.

The health of the guests was proposed by Mr. L. CARNAC RIVETT. He recalled that many Middlesex men entered the Services, which were represented by Lieut.-General Sir James Hartigan, Director-General A.M.S., and Air Vice-Marshal A. W. Iredell, R.A.F. In reply, Mr. H. L. EASON, Vice-Chancellor of the University of London and superintendent of Guy's Hospital, said that no hospital had made more remarkable progress than the Middlesex in the course of the last thirty years. Speaking as a member of another hospital, Mr. Eason said that the medical profession in general shared with Middlesex men their pleasure in the honours conferred on Sir Alfred Webb-Johnson, whom he characterized as a magician for attracting money. As Vice-Chancellor of London University Mr. Eason said that the University had honoured itself in honouring Mr. Courtauld. Mr. D. H. PATEY proposed the health of the chairman, and spoke of the warm and filial regard which every worker in the Bland-Sutton Institute felt for its director, and of the remarkable capacity for original research hidden beneath the modest and diffident exterior of this welcome immigrant from Aberdeen.

ST. BARTHOLOMEW'S HOSPITAL

ANNUAL DINNER

The old students' annual dinner of the Medical College of St. Bartholomew's Hospital was held in the College Hall, Charterhouse Square, on October 1st, with Sir CHARLES GORDON-WATSON in the chair. In proposing the health of the medical college, coupled with the name of the chairman, Sir KINGSLEY WOOD said the hospital had had a fine record of over 800 years. The inception of a medical college on the lines of the older universities had been an outstanding feature of the last three years. St. Bartholomew's had become a pioneer of medical education in this country. The new buildings had been planned on the most modern approved lines, and in three years the greater part of the £200,000 required had been raised, of which Bart's men had contributed £50,000. The excellent response had been due in great part to the energy and imagination of Mr. Girling Ball. The college was equipped not only for the teaching of students but for the carrying on of research. He hoped that the idea of building a residential college would be speedily fulfilled.

In response, Sir CHARLES GORDON-WATSON recalled the fact that on the first occasion on which a dinner had been held in the College Hall the present King was the principal guest, and that he was a perpetual student of the hospital. After referring to the deaths of old Bart's men —Sir Archibald Garrod, Sir Wilmot Herringham, Dr. Ronald Canti, Dr. Hurtley, Dr. John Melly, and Mr. H. P. Nelson—he reviewed the activities and successes of the college and hospital. A residential college, Sir Charles said, was urgently needed, but they still had a debt of £25,000. He appealed to old Bart's men for assistance. The *x*-ray department had outgrown its present quarters, and it was hoped to reconstruct space for the gynaecological department. The most urgent need, however, was for a block for paying patients. The time was not far distant when nursing homes would be a thing of the past. Bart's stood almost alone in London in being unable to render service to the paying patient, and Sir Charles made a strong appeal for help in making good this deficiency. Here, he said, was an opportunity for a multi-millionaire. The success of the college was due to the remarkable energy of the dean, Mr. Girling Ball, and he, Sir Charles, would like to see another fountain in the college, a replica of the old one in the Hospital Square, with the name of the dean inscribed on it.

In proposing "The Guests" Sir Walter Langdon-Brown said that at the beginning of the negotiations he had for the first time seen the dean look gloomy, a look which was soon removed when Mr. J. H. Millar had started things off with a gift of £20,000. He recalled the fact that ninety years ago Sir James Paget wrote to his brother that he thought they would soon have a residential college worthy of the hospital. Among the guests Sir Walter said that the medical profession particularly welcomed Sir Kingsley Wood as Minister of Health. In reply, Professor L. S. Dudgeon, dean of St. Thomas's Hospital, said that in 1934 the outline of a co-operation between St. Thomas's and St. Bartholomew's had been formed, and since then Guy's had joined in this. This co-operation, he believed, would be of great benefit to medical education. There must be co-operation between the voluntary hospitals if they wished to remain voluntary hospitals. The health of the chairman was proposed in a felicitous speech by Dr. H. Morley Fletcher. Sir Charles Gordon-Watson, who received a great ovation, replied.

ST. THOMAS'S HOSPITAL

OLD STUDENTS' DINNER

Dr. J. R. Harper, C.B.E., of Barnstaple, who presided over the old students' dinner of St. Thomas's Hospital at the Dorchester Hotel on October 2nd, remarked in proposing the toast of "The Hospital and its Medical School" that the evolution of the hospital of modern times should be counted one of the greatest triumphs which had been achieved in consequence of the steady advances made by scientists. He added that full confirmation of this view was obtainable in the pages of the third volume of the *History of St. Thomas's Hospital*, which had been recently published; for his outstanding services in compiling this most valuable record Professor Parsons deserved the warmest thanks and congratulations. Responding to this toast, the treasurer of the hospital, Sir Arthur Stanley, opened with a humorous reference to the split between the institution and Guy's Hospital a century ago, and expressed the wish that the present dean of St. Thomas's would wear the striking garb of one of his predecesors. The building of the Nurses' Home, Riddell House, was being pushed on as quickly as possible. Its completion would permit the enlargement and rearrangement of the block for paying patients, all the main rooms of which would have excellent views of the river frontage. The main difficulty of every hospital nowadays was the continued expansion called for by the unceasing progress in the science of therapeutics; this constituted an unending nightmare for hospital treasurers, who had to find the money for the erection and equipping of new departments. Professor Leonard S. Dudgeon, dean of the Medical School, who also responded to this toast, referred to the gift of the Michael and Sidney Herbert Building for Medical Research. Necessarily protracted consideration of the architectural plans had delayed the progress of the work, but it was hoped that the building would be completed in the next twelve months. The hospital would then possess a fully equipped laboratory for experimental research which would be of very great clinical value. References were also made by the dean to the gift of a bursary of £1,000 to help members of the Medical School, to the departure of Professor John Mellanby to Oxford and the succession of Professor McSwiney of Leeds to the post thus vacated, and to various other staff changes.

Proposing the toast of "Our Guests," Professor Dudgeon paid a warm tribute to the value of the increasing close co-operation between the three London hospitals of Bart's, Thomas's, and Guy's, as evidenced that night by the presence of their respective deans. Such co-operation was essential throughout the country if the voluntary system was to be maintained and to flourish. He alluded to the excellent service rendered by Mr. O. N. Chadwyck-Healey, particularly to the Great Ormond Street Hospital and to King Edward's Fund, and added that this was surely the only country in the world where such voluntary work was possible and could achieve such great results. Mr. Chadwyck-Healey, replying for the guests, emphasized the value of the British system of voluntary hospitals and of their co-operation. The toast of "The Chairman" was proposed by Colonel R. J. C. Thompson, who remarked that "Harper of Barnstaple" was one of those wonderful persons who never seemed to have left St. Thomas's, and of whom the hospital had good reason for being very proud. His services during the war to the 14th Stationary Hospital had been exceptionally brilliant, and in many ways he personified the outstanding virtues of Devon, particularly in his warm hospitality and staunch comradeship and reliability in times of stress. Dr. Harper, in his reply, alluded to the circumstances of early country practice, which was conducted mainly on horseback, and often involved a considerable knowledge of horsemanship and horse-breeding.

The number of toasts was limited, as in previous years, so that those present might have full facilities for renewing old friendships. The arrangement of many separate tables for groups of contemporaries also conduced to this end, which was most happily achieved. Those present at the high table included Sir Cuthbert Wallace, P.R.C.S., Sir George Roberts, Sir Maurice Cassidy, Lieut.-Colonel A. P. B. Irwin, Professor T. B. Johnston, Mr. W. Girling Ball, Mr. R. Percy Smith, and Dr. G. F. Stebbing.

ST. MARY'S HOSPITAL

ANNUAL SCHOOL DINNER

The St. Mary's Hospital Medical School dinner was held at Claridge's on Saturday, October 3rd.

Dr. J. O. Symes, the chairman, referring to the magnificent new school buildings, spoke of the opportunities of research that they afforded. He ridiculed the criticism that too much attention was paid at some medical schools to athletics. There was a widespread movement at the present day to insist upon regular exercise as the most important factor in the preservation of health. In future everyone was going to have more leisure, and the time would come when playing football once a week, or on occasions twice, would not be accepted as an adequate means of achieving that end. Though squash rackets and swimming had greatly altered conditions, conditions at a London medical school were such that there was not the least danger that students would spend too much time in exercise.

Dr. W. E. Henley, proposing the toast of "The Medical School," said that St. Mary's was fortunate in that it never lost sight for a moment of the vital fact that the size of a medical school should be governed by the number of beds available for clinical instruction. The school had acquired the ground of the Old Merchant Taylors at Teddington, thirteen acres in extent, and would enter into possession in August of next year. Unlike the vast majority of athletic grounds in London and its neighbourhood it was on gravel and not on London clay, and that meant that for all practical purposes it was as dry in winter as in summer. From their experience of Wembley they knew that football on clay and football on gravel were two different games.

Dr. C. M. Wilson, dean of the Medical School, who replied, paid a tribute to the work of the house governor, Colonel W. Parkes. The first section of the nurses' home would be opened by the Duchess of York on Wednesday, November 18th. When the nurses' home was completed certain accommodation now occupied by the nurses would be available for patients, and this would bring the total number of beds to 570. The school owed a great deal to Lord Beaverbrook, whose benefactions had transformed the conditions under which the students worked and played. The hospital was under a lasting debt of gratitude to an anonymous donor for his munificent gifts now totalling £107,000.

THE NEW ALTITUDE RECORD

MEDICAL ASPECTS OF STRATOSPHERE FLYING

The Air Ministry announced on September 29th that on the previous day the Royal Air Force experimental high altitude aircraft, the "Bristol 138" with a special "Pegasus" engine, piloted by Squadron Leader F. R. D. Swain, reached an altitude of 49,967 feet (15,230 metres), thus breaking the world altitude record established in August by 1,269 feet (387 metres).

The aircraft took off from the aerodrome at Farnborough, Hants, at 7.30 a.m., and landed at Netheravon, Wilts, at 10.50 a.m. During the ascent visibility was good, but there was a cold north-easterly wind of considerable strength at lower levels and of hurricane force in the upper air. The performance of the aircraft and engine was entirely satisfactory, and the sealed pressure suit enabled the pilot to remain at very high altitudes for nearly two hours while he endeavoured to attain the maximum height possible.

The attempt was observed by an official representative of the Royal Aero Club, and the height attained has been officially communicated to the Ministry by the Club; it was arrived at from an examination by the National Physical Laboratory of the sealed barothermographs carried in the wings of the aeroplane. The figures are subject to the usual confirmation and acceptance by the Fédération Aeronautique Internationale, to which it is necessary to make application for homologation of the record.

The minimum pressure measured during the flight was 92 millimetres of mercury, and the lowest temperature was −49.8° C.; both those measurements were at the highest point attained.

The High Altitude Pressure Suit

The need for providing a sealed flying suit (or a sealed cockpit) for the pilot is fully dealt with in the note printed below by Group Captain G. S. Marshall, O.B.E., of the Central Medical Establishment, R.A.F. It should be noted here, however, that at heights above 43,000 feet it is necessary to resort to some means of artificially increasing the pressure in the lungs, and the system of supplying pure oxygen alone through a simple face-mask in altitude flights below this level cannot therefore be employed.

The sealed suit, produced by Siebe Gorman and Company, which is based upon the work of the late Professor J. S. Haldane, M.D., F.R.S., and Sir Robert Davis, in conjunction with the Air Ministry, has been developed to meet this essential condition. Certain details remain confidential, but it can be stated briefly that the suit is inflated to a pressure adequate to sustain life at any altitude. In such a suit individuals, including Squadron Leader Swain, have been taken in the low-pressure chamber at Farnborough to an "altitude" of 80,000 feet without undue discomfort. Wearing the suit at lower altitudes they have piloted aircraft in flight with satisfactory vision and control.

The suit is made of rubberized fabric, fitted with a helmet of the same material with a large, curved double window. The suit is constructed in two pieces, a pipe clip type of joint being made around the waist. A panel is incorporated in the helmet to enable the occupant to free his head quickly in an emergency. The breathing circuit is of the closed type. Oxygen is fed into the circuit at the requisite rate, the oxygen jet being the driving element in a small injector, which produces a rapid circulation of gas round the system. From the injector the gas passes through a flexible tube, entering the helmet on the right-hand side of the face and passing across the face to an outlet on the left. The gas now containing the exhaled breath passes down the flexible tube to a canister containing chemicals which absorb the carbon dioxide and moisture from the exhaled breath; it then issues from the canister outlet as pure oxygen to be recirculated through the system. The necessary accessories, such as the inflation and deflation controls and gauges for registering the pressure in the oxygen cylinders and in the suit, are provided in convenient positions for operation and inspection during flight.

Medical Notes on Altitude Flying

By Group Captain G. S. Marshall

Human beings are physiologically adapted to breathing air, of which one-fifth is oxygen, at a pressure of about 15 lb. per square inch, but their degree of tolerance is such that they can continue to live, if they do no appreciable amount of physical work, when the atmospheric pressure falls to little more than half this value. The pressure of the atmosphere falls with increasing height, being one-half of its ground-level value at a height of 18,000 feet, and rather more than one-ninth at 50,000 feet. Consequently, at 18,000 feet the natural atmospheric pressure does not provide enough (that is, a high enough partial pressure of) oxygen for full human activity, and so has to be supplemented by one of two methods—increasing the percentage of oxygen in the air inspired, or increasing the pressure within the subject's lungs. The former, being the more easily practicable, is used where necessary for all flying altitudes which may at present be regarded as normal, but even when carried to the limit—breathing pure oxygen—is inadequate for altitudes much exceeding 43,000 feet. At this height breathing pure oxygen is physiologically comparable to breathing air at 15,000 feet, which is usually regarded as the safe limit of height for flight without oxygen.

Beyond 43,000 feet it is therefore necessary to resort to some means of artificially increasing the pressure in the lungs, either with or without the use of additional oxygen. For physiological reasons this cannot be done to any useful extent without balancing the pressure within the lungs with that outside them; hence the subject's immediate atmosphere has to be maintained, at least, at a pressure equivalent to that of the atmosphere at 43,000 feet. This can be done by subjecting him to a pressure slightly above that of the atmosphere in either an airtight cabin or an airtight suit; the former is rather better from the physiologist's point of view, the latter much better from that of the aircraft designer, and the effective compromise is a sort of diving-suit of highly specialized character in which a relative positive pressure (that is, above that of the outer air) is automatically maintained at a predetermined value. With this degree of relative pressure the pilot has an ample margin of safety. A lower degree could be used, with consequent reduction of safety, but since the onset of oxygen-starvation is dangerously insidious, and indeed is usually denied by the sufferer, it is manifestly preferable to use the highest degree of relative pressure compatible with the pilot's adequate freedom of movement. On the other hand, a greater pressure would make it unbearably difficult for the pilot to move and control his limbs (the reader may remember the huge Michelin figure, Bibendum, at previous motor shows, which flung out its arms on being inflated), but fortunately no greater pressure is necessary, since this quite tolerable degree of relative pressure within the suit will so reduce a pilot's "physiological height" as to enable him to exist in safety and even in some degree of comfort at infinite height—that is, in an absolute vacuum. Under these conditions, therefore, so far as his bodily functions are concerned, he could fly to the moon. Thus at one point in the see-saw of relative performance man has, perhaps permanently, outstripped the machine.

Very rapid changes of altitude have two possible effects on the human body. The tiny pocket of air imprisoned in the middle ear communicates with the outer air by means of the small Eustachian tube, whereby its pressure is constantly being adjusted to correspond with such changes of atmospheric pressure as are caused by variations of the barometer, entering or leaving a "tube" tunnel at speed, travelling in a lift, etc.; the swelling of the nasal mucous membrane associated with a cold in the head, however, may make this adjustment difficult or impossible without pain or injury, particularly in descent, when the valve-like action of the Eustachian tube impedes adjustment more than in ascent. Pilots are

therefore at pains to avoid flying when unable freely to inflate the ears, especially if their duties involve long rapid descent ; those who are so able, however, encounter no more than inconvenience in making very rapid descents of many thousands of feet at a time. The late John Tranum had no difficulty in adjusting his ears during a free fall of some 20,000 feet before he opened his parachute, though the speed of a diving aircraft may far exceed that of a human body falling freely at any altitude. The other effect is, so far, only theoretical ; it is the analogue of " bends " in a sea-diver, caused by the liberation in the blood of minute bubbles of nitrogen when the atmospheric pressure is so rapidly reduced that the gas cannot escape by its normal outlet, the lungs, much in the same way as the compressed carbon dioxide in a siphon of soda-water is seen to rise in a cloud of bubbles when the pressure has been reduced by drawing off some of the liquid. Neither of these effects is likely to appear in a healthy experienced pilot at any rate of ascent or descent now practicable.

Stratosphere flying does not impose any extraordinary strain on the fit pilot ; provided that he is healthy (and a person with a cold in the head is not healthy) and physically up to the exacting standards of the Royal Air Force, and that his protective devices do not fail, his physiological problems are *nil*, while the risk of such failure of the pressure-suit or oxygen supply has been reduced by careful design, manufacture, and experiment to a negligible quantity.

CONFERENCE ON MENTAL HYGIENE

EUROPEAN REUNION IN LONDON

The fourth European Mental Hygiene Reunion, which was opened by the Duke of Kent on October 5th, devoted its three sessions to the discussion of three important influences in modern life—the cinema, the nurse, and the school.

Mental Hygiene and the Cinema

Dr. Jakob Billström, the Swedish Government film censor, said that in the short period of less than fifty years the cinema had become a factor of such importance in human life that it was the duty of the State to assume a certain measure of control. From the point of view of mental hygiene the most important aspect in the relationship of State and cinema was the protection of the populace, especially the children, from harmful psychological influences. In Sweden a central State film bureau was established in 1911, which had the power to ban such films as might be " in conflict with general law or good morals, or which may otherwise operate in a manner calculated to coarsen or to inflame the imagination, or to disturb the sense of right." " Films which portray scenes of terror, suicide, or gross crime in such a manner " were similarly treated. The State had, in fact, recognized the possibility of psychological damage from this source.

Dr. Billström stressed the distinction to be made, from the psychological standpoint, between the theatre and the cinema. Quantitatively, the public influenced by the former, even after the long run of a successful play, was negligible in comparison with the number frequenting a popular film, which might be shown several times daily in different cinemas throughout the country. The qualitative difference was also marked. The theatre audience realized that it was watching actors in a play ; it was more concerned with the acting than with the action. The play was regarded as make-belief rather than reality. The film, on the other hand, produced a strong sense of actuality, especially on those people, constituting a definite majority, who were particularly susceptible to visual impressions. This feeling of actuality was further strengthened by the modern methods of sound reproduction.

In films which stressed the sex element the effect was magnified by the erotic contact of couples in close proximity, and by a general feeling of intimacy, less noticeable in the theatre. The film, indeed, stood nearer to primitive, archaic, symbolic thought-processes: it more closely resembled the dream. The film also had " unlimited possibilities of technical variation and of emotion linking up with the daily environment of everyone and thus passing direct to the realization of wish-fantasy in beauty, sumptuousness, luxury, and progress." Its greater suggestive power depended on its " direct appeal to our more primitive senses by reason of immediate effect-resonance and freedom from all intellectual logical effort."

With regard to the psychology of the film censor it was necessary for him to eliminate his own personal attitude and to divest himself, so far as possible, of his own particular complex. To achieve this state of mind practice and experience in the task of censorship were required. He must also identify himself with the mentality of the average spectator, visualizing his milieu and his probable mode of reaction to a film, and by himself visiting the cinema gain practical experience at first hand of the psychology of various types of audience. From the point of view of the majority mental hygiene demanded a certain measure of film control.

The Film Addict

Dr. A. Répond (President of the Swiss National Committee for Mental Hygiene) said that the cinema was obliged to obey the pleasure and tastes of one changeable and imperious tyrant, the public. This was the basic fact for the psychologist. With the automobile and the radio the cinema presented one of the greatest pleasures of modern times ; it opened the door of escape from reality. The spectator identified himself with the object of romance and intrigue, or with the hero in the adventure. Thus living through the romance he rediscovered unconsciously under constantly changing forms the instincts and feelings of those childhood dreams of abandonment, love, and power which once dominated him. For everyone must of necessity go through the same developmental cycle in emotion and instinct, the identical tragedies of hope, frustration, and conquest. The periodical distraction from reality, as provided by the cinema, was a biological necessity for man. Tobacco and alcohol also ministered to this need. Abuse of these escape-opportunities of the cinema, though not requiring the prohibition desirable in the case of drunkards, nevertheless from the point of view of mental hygiene created a vicious circle from which escape was difficult. The more we fled from reality the harder it was to live in it and accept it. In Dr. Répond's experience cinema addicts were in general unstable and ill-adjusted, often asocial and incompetent in everyday affairs, lazy, and bored. The true neurotic, however, rarely showed enthusiasm or even interest in the pictures, and mental patients often evinced a violent antagonism. Living apart from reality in their neuroses, they did not feel the need of further escape. In convalescent cases the successive stages of recovery were marked by an increasing enjoyment of the cinema, as once again they submitted to reality. In the films the mechanism of pleasure was transposed to a purely psychic plane. This the art of the cinema producer intensified by playing on a whole gamut of emotions and sensations of different intensity, making them pulsate sometimes separately and sometimes in unison through different ranges of sensibility. It was open to question whether the constant repetition of this peculiar enjoyment, experienced with the passivity of instinct and emotion which it entailed, did not cause a diminution in the active tendencies of the individual, a weakening of character, and an abnormal raising of the threshold of excitability.

Despite the small epidemic of suicides following the death of Rudolph Valentino, Dr. Répond did not consider the question of " star worship " of prime importance from the psychological point of view. Here the spectator identified the film star with himself or herself, and the

star became an ideal to be passionately admired and adored. A more disturbing phenomenon was the aggravation of juvenile delinquency by films dealing with detectives and crime. In some cases the precocious development of undesirable instincts might thus be accelerated. More often, however, such films acted as a safety valve, despite the general belief to the contrary, evidenced by the frequency with which young offenders cited the cinema as an excuse for their misdeeds in court. The cinema was a powerful agent of both individual and mass suggestion, and in the latter role might constitute a dangerous weapon, the potentialities of which had not yet been sufficiently studied. History recorded a revolution originating from a scene in an opera. A film might perhaps be the spark to light another conflagration.

Professor G. VERMEYLEN (professor of psychiatry at Brussels University) considered that the dangers of the film, though real, were often exaggerated, while there was a tendency to belittle its advantages. A well-chosen recreative film could give a child relaxation and satisfy its need of dreams and imagination. Educational films of the right type had an excellent influence on the child's intellectual development. Scientific films dealing with children could perform a useful function in the instruction of parents and teachers.

Mental Hygiene and the Nurse

Dr. HANS ROEMER (secretary of the German Council for Mental Hygiene) opened a discussion on the role of the nurse in mental hygiene. It was her part to strengthen the "will to resist" in patients dangerously ill; to reinforce the will to recovery in convalescents; to guard against boredom and apathy in the chronic invalid. It was necessary to combat the dangers of hospitalization, both by the American method of providing physical exercises and occupations and by Dr. Rollier's method of demanding work from those patients able to undertake it. In either case demands were made on the educational capacity of the nurse. Even more necessary was her collaboration in the treatment of neurological cases and of drug addicts, where judgement and firmness, patience and sympathy, were of paramount importance. Mental cases constituted the most difficult task in nursing, for, since the plaints and miseries of the patient were for the most part due to fantasy, they were therefore beyond the reach of her influence. Nevertheless it was possible, with positive treatment, to persuade excited and asocial patients, including schizophrenics, to pursue sensible occupations under "intensive" influence. In institutions in Germany the proportion of working patients was increased by 70 to 80 per cent. in the last decade, with a reduction of 40 to 50 per cent. in consumption of narcotics. A legal obligation fell on the mental nurse in Germany to assist in preventing the procreation of a dysgenic posterity by sympathetic explanation of the sterilization law.

In Germany out-patient psychiatric services had been established, which facilitated the early return of mental convalescents to normal life. In this field the nurse required tact and sympathy in her dealings with the patient's relatives. Dr. Roemer stressed the need for a thorough training for nurses, and for the provision of adequate facilities for recreation, good food and accommodation, and sufficient holidays.

Dr. VIKTOR WIGERT (Stockholm) deplored the fact that the nurses in mental hospitals were too often insufficiently trained in general nursing. It was essential that fully trained nurses should be employed in this work. Apart from the requirements of modern therapeutics in mental institutions a broad basis of training and the consequent richer experience rendered a nurse more capable of a thorough understanding of her task than one trained only in the restricted field of a mental hospital. In Sweden the authorities had tried to promote the social standing of the mental nurse, and to remove a certain stigma of inferiority which had attached to this branch of the profession. The importance of mental nursing was increasingly recognized, and four months' practical instruction at a mental hospital was now included in the general nursing curriculum.

Dr. H. KOGERER (Vienna) stressed the importance of personality in a nurse. A sick man became temporarily a child, with the instinct of turning to his mother. For this reason female nurses were to be preferred in most cases to male, and women of a maternal type, who would regard their patients almost as children, became the most satisfactory nurses. In selecting candidates for the nursing profession it was necessary not merely to impose a medical examination, but also to examine carefully the candidate's mentality from the psychological point of view.

Mental Hygiene and the School

In the session devoted to mental hygiene and the school Professor K. H. BOUMAN (Amsterdam) pointed out that much more attention had been generally given to the "baby" and "child" periods than to the final phase of adolescence, the period of transition to a social career, which was of the greatest importance in mental hygiene. During this time the formation of personality was completed, and the psychopathologist could with advantage collaborate with the teacher. In this stormy period many dangers lurked, especially the problems of sex. Since sexual enlightenment of their children was habitually neglected by parents this task must be undertaken by the psychotherapeutist or the teacher.

It was unfortunate that in modern times the consumption of alcohol by young men was increasing, and that the increase was even more marked among young women. This stimulus at a time of life marked by great sensibility and a certain instability led to both aggressive and sexual delinquencies and to an increase in venereal disease.

A number of mental diseases, notably schizophrenia in all its forms, first showed themselves at this period. These troubles were prone to affect the most brilliant scholars. By early recognition the necessary measures could be taken to restrict the dangers to the patient to a minimum. It was desirable that psychopathologists should be available regularly to examine and advise pupils and students between the ages of 16 and 21.

Dr. J. R. REES (London) pointed out that the problem assumed a different aspect in England owing to the lamentable fact that most children in this country left school at 14. Only 7 per cent. of the under 18 age group received the privilege of higher education.

In England the examination system created problems for both the psychiatrist and the teacher. The increasing demand for standardized academic qualifications was inimical to individual freedom and development. Excessive competition tended to produce superiority–inferiority conflicts. But a favourable factor in the system in vogue in this country was the feeling of social responsibility resulting from the community life, in which games and the sense of sportsmanship figured largely. It was desirable that children of indifferent intelligence should be eliminated from higher education. They could be helped and trained by scientific methods of vocational guidance, such as were employed by the National Institute of Industrial Psychology. To-day it was little short of a social crime to let any child become a vocational misfit without a struggle.

H. W. Hudson, jun., and C. Krakower (*New England Journ. Med.*, July 9th, 1936, p. 59) have collected forty cases of measles complicated by acute appendicitis, of which nine are original, and therefore conclude that there is an intimate relationship between the two diseases. They recommend that in every case of measles a thorough examination of the abdomen should be made, together with careful appraisal of the symptoms of abdominal pain and vomiting which are frequently present. If signs of appendicitis are found, operation is indicated in spite of the presence of measles. Of the forty cases on record appendicitis developed in the prodromal stage in fifteen, in twelve during the eruption stage, and in thirteen in early convalescence. Thirty-nine were children or adolescents. There were only two deaths.

RESEARCH ON CANCER

INTERNATIONAL CONGRESS IN BRUSSELS

The second International Cancer Congress, held at Brussels under the auspices of L'Union Internationale Contre le Cancer, ended on September 28th. Between three and four hundred surgeons, physicians, radiologists, and research workers, drawn from forty-seven different countries, were in attendance, and were welcomed by M. Lerat, president of the Congress, by M. Justin Godart, president of L'Union Internationale Contre le Cancer, and by M. Vandervelde, Belgian Minister of Health, in the presence of H.M. the King of the Belgians.

Great Britain was officially represented by Dr. Cramer, Colonel Smallman, Mr. Sampson Handley, Mr. Shaw, and Mr. Cecil Rowntree. There was also a large group of workers from the great research centres, which included Dr. Gye, Professor Kennaway, Professor Cook, Dr. Passey, Professor Matthew Stewart, Dr. Dorothy Russell, Dr. Peacock, Dr. Donaldson, and Mr. Stanford Cade.

The Belgian committee, to whom the organization of the Congress had been entrusted by L'Union Internationale, by a wealth of private and public hospitality did much to establish a degree of intimacy between the nationals of so many diverse countries, and added greatly to the success of the Congress.

Official Functions

Among the more notable official occasions was a reception by the Prime Minister and Mme van Zeeland held at the beautiful Musée Cinquantenaire, and a banquet at which speeches were made by representatives of Germany, France, Great Britain, Italy, Spain, Greece, and Sweden expressing their appreciation of the great scientific and social success of the Congress. During the latter one delegate felt that song was the only suitable medium with which to express his feelings, and brought down the house with his delightful rendering of "Qui ne sait boire, ne sait rien."

But perhaps the most interesting event—at any rate so far as the delegates from the British Empire were concerned—was the reception on the last evening at the Fondation Universitaire, when the opportunity was taken to present to Professors Kennaway and Cook the prize award of the Union Internationale. The allocation of this prize to the two English research workers was unanimously voted at a meeting of the council of the Union, attended by the official delegates of forty-seven countries. It consists of a sum of money and a quantity of radium, generously placed at the disposal of the Union Internationale by the Union Minière.

Aspects of the Cancer Problem

In addition to a large number of independent papers, thirty-five official reports were presented. All the different aspects of the cancer problem came under consideration, and the subjects ranged from the demonstration of micro-puncture of cells by ultra-violet rays to the provision of hospital accommodation for incurable cancer patients.

For the presentation of the communications six different Sections had been created, and by skilful organization it had been arranged that papers relating to allied subjects were read in one Section, and so far as possible at the same meeting. One of the most interesting meetings was a discussion on carcinogenesis, in which Professors Kennaway and Cook spoke on chemical compounds as carcinogenic agents, and Dr. Gye on tumours transmissible with viruses. At a subsequent meeting Professor Pentimali (Florence) submitted a report on the nature of the agent present in the filterable fowl tumours. The hereditary factors in cancer were discussed by Miss Clara Lynch (New York), Miss Maud Slye (Chicago), Dr. Keryberg (Oslo), Mme Dobrovolskaia-Zawadskaia (Paris), Professor Korteweg (Amsterdam), Miss Wilhelmina Dunning (New York), and Professor Hintze (Berlin).

Communications on the experimental investigation of cancer were submitted by Dr. Peacock (Glasgow), Professor Passey (Leeds), Professor McIntosh (London), Dr. Schuerch (Winterthur), Professor Oberndorfer (Istanbul), Dr. Berenblum (Leeds), and others. The interesting new subject of transplantable fibro-adenomata of rats and their transformation into sarcomata was discussed by Dr. Oberling (Paris) and Dr. Heimann (New York). Mr. Sampson Handley (London) presented his thesis on the aetiological importance of lymph stasis.

On the subject of the diagnosis of cancer Professor Ewing (New York) read a report on problems in histological diagnosis. Professor Hirszfeld (Warsaw), Professor Rondoni (Milan), and Professor Del Rio Hortega (who had specially travelled from Madrid to attend the congress) discussed the serological and sero-cytological diagnosis of cancer. Dr. Dorothy Russell showed her instructive film demonstrating the tissue culture of gliomata.

Progress in Radiotherapy

The papers read in the Section of Radiotherapy by Professor Carter Wood (New York), Professor Schinz (Zurich), and Professor Mallet (Paris) gave an indication of the progress made in this important branch of cancer therapy as a result of a better understanding of the mode of action of *x* rays and radium. By a modification of the previous technique Schinz had succeeded in obtaining in tumours of the mesopharynx, in which previously radiotherapy had been a failure, a remarkably high percentage of five-year cures. Schinz also emphasized the importance of radiotherapy as a palliative measure in cancer. This aspect was dealt with in greater detail in the communication of Professor Mallet. He has applied systematically tele-*x*-ray therapy to patients in advanced stages of cancer, by exposing large parts of the body at long distances. He showed by numerous illustrations that his method enabled him to check the progress of the disease in advanced stages of cancer of the uterus and of the oesophagus, and also metastases in bones and lungs. Mr. Stanford Cade gave an account of the results obtained by tele-curie therapy in pharyngeal cancer.

In the Social Section the importance of statistics as a scientific method for the investigation of the aetiological factors of cancer in man was emphasized in reports by Dr. Dublin (New York, Dr. Cramer (London), and Professor Peller (Jerusalem). Some of the American and German delegates, believing that a morbidity statistic would advance our knowledge, submitted a resolution that the compulsory notification of cancer was advisable from this point of view, and that the International Union should appoint a committee to consider this question. The incidence of cancer in different races was discussed by Professor Bonner (Batavia) and Professor des Ligneris (South Africa).

The thorny problem of the medical treatment of cancer was discussed in numerous communications. One of these methods which, described as a polyvalent hormonetherapy, had received a good deal of notice in the Continental Press, was submitted to a devastating criticism; while the more serious attempts by Professor Freund and Dr. Kaminer of Vienna, which were frankly admitted to be mainly of a palliative nature, were listened to with respectful scepticism.

Conclusion

The general feeling among the delegates was that definite progress had been made both in our understanding of the disease and in the methods of treatment; and that a continuation of this progress was assured. This feeling found expression in the conclusion submitted at the final meeting, in which it was stated for the first time officially that cancer was a disease which is not only curable, but also, within limits, preventable.

The French Society for the Propagation of Cremation has just published its annual report, according to which 920 cremations were undertaken in 1935 in Paris. The corresponding figures for Strasbourg, Marseilles, Lyons, Rouen, and Rheims were 215, 145, 44, 8, and 2 respectively.

Reports of Societies

CARBON DIOXIDE ABSORPTION FROM ANAESTHETIC ATMOSPHERES

The autumn session of the Section of Anaesthetics of the Royal Society of Medicine, the new president, Dr. C. LANGTON HEWER, occupying the chair, opened on October 2nd with an address by Dr. RALPH M. WATERS of Wisconsin University, Madison, U.S.A., on carbon dioxide absorption from anaesthetic atmospheres. Before giving his address Dr. Waters was handed, by the president, the scroll of honorary membership of the Section.

Dr. Waters first dealt with the historical aspect of the closed system of inducing anaesthesia, remarking that his first view of the apparatus was in a Munich museum, the date of it being 1849. The first application of the system to anaesthesia was by Professor Dennis Jackson of Cincinnati, but Professor Swan had used a similar system in 1853 for restoring miners who had been prostrated by poisonous gases. That apparatus was complete, with a portable alkaline chamber; there were two small tanks under a pressure of four to five atmospheres. In 1909 Benedict carried out experiments on metabolic processes by means of a closed chamber. Professor Dennis Jackson's apparatus had a breathing-bag connected with the inhaler, and attached to it was a system which sucked air out of the breathing-bag and blew it back through barrels of caustic soda enriched with oxygen; the circuit was made with a motor. That was in 1915. Dr. Waters said the use of a motor was contrary to his own ideas of safety, therefore he tried to work with one-way valves. A good deal had been done on the adaptation of alkaline absorbents of carbon dioxide, and he demonstrated the importance of the shape, size, and construction of the containers for the soda lime in ensuring safe and efficient carbon dioxide elimination. A very useful size of canister was 12 cm. by 8 cm., with a wire gauze dam at each end, and a slip joint. In this 4 to 8 mesh soda lime was used, which, it was found, showed no tendency to deliquesce. The psychological factor in anaesthetization was always important, and every care must be taken to eliminate all sensation of resistance to breathing. The normal course of induction was apt to be seriously interfered with if the patient had been given one of the barbiturates; there might then be an absence of the usual rise in the systolic pressure. In America many forms of soda lime were on the market which were stated to be efficacious, but in Dr. Waters's experience only one manufacturer there had produced the proper substance. The more porous the particles the more absorptive was the material. The optimum moisture content was 14 to 19 per cent. In order to derive the full effect there must be exposure to the soda lime for a sufficient time.

Three Essentials for Success

For a safe and properly controlled application of the closed method three things were essential. First, it was necessary to ensure a completely free airway; there must be some device which would go over the base of the tongue and pull it over the glottis. The apparatus he used enabled the anaesthetist to keep out of the way of the surgeon when the latter was occupied with the patient's head and neck. Secondly, it was necessary to have an apparatus which had no leakage; and thirdly, a mechanical construction which avoided resistance to breathing while permitting sufficient contact of atmosphere with alkali to remove completely the carbon dioxide from the inspired gases. The latter should also eliminate "dead space" or rebreathing; between the patient and the lime soda was a dead space, where the carbon dioxide tended to accumulate. Unless a special mask was used, thyroid operations constituted a problem. With the progress of the anaesthesia there was a tendency for the carbon dioxide in the tissues to increase. Dr. Waters showed a photograph of a convenient-sized apparatus designed for easy transit in a motor car. It enabled the anaesthetist to keep all the important area in his visual field, and could easily be demonstrated to advanced students.

Over ten thousand patients had been anaesthetized in a few years at Madison, and 84 per cent. of them with the absorption technique. The total death rate during that time was 3.33 per cent. As there was no anxiety about the occurrence of a static spark, fires to warm operating theatres were now more commonly used. Operators spoke of the greater comfort with which they could carry out, under this closed method of anaesthesia, a hard day's operating. The contention was that a nearer approach to normal physiology was preserved by this technique than by any other. The oxygen and the carbon dioxide content could be better controlled by it, owing to the need of concentrating on the avoidance of obstruction to respiration. Also, the patient showed less tendency to sweat and less shock.

Discussion

The PRESIDENT suggested that some of the trouble which might be experienced in the closed circuit technique might be due to an excess of liquid in the alveoli. If there was a provision for temporarily suspending the action of the soda lime it might be an advantage. Dr. E. S. ROWBOTHAM said that in nasal intubation cases the carbon dioxide absorption method was easy, for there was no trouble about the airway, and something like normal respiration was carried on. In many of his cases in which cyclopropane was used there was a rise in the blood pressure, which might have been due to the carbon dioxide not being efficiently absorbed. He raised the question of how far the rise of blood pressure in patients was due to altered carbon dioxide content, and how far to a departure from the normal physiology. Dr. C. E. SYKES paid a high tribute to the work of Dr. Waters and to the wonderful organization with which Madison was favoured. In Britain there were many places where this department of work was almost entirely without organization. Evidently Dr. Waters had brought down the general anaesthetic death rate by about 1 per cent., which represented an enormous aggregate saving of lives. Dr. D. JARMAN remarked that in more than one hospital at which cyclopropane was used there had been an increase in chest complications. It had also been found that in cases in which oral sepsis was present fresh chest complications arose. He was curious to know whether the closed system of anaesthesia was responsible for more chest complications arising than there should be.

Dr. J. BLOMFIELD stated that ever since he read Dr. Waters's description of this method he had tried to carry it out in a simple way, and with simple apparatus he had achieved very successful results, though not in major abdominal operations. He had been able to cut down the amount of nitrous oxide, and had kept the patient's respiration quiet by using the absorption method. Dr. M. D. NOSWORTHY said that with the soda lime he used he did not get more than two hours of absorption, employing canisters of two-thirds capacity of those of Dr. Waters, showing that there was need of a better quality of soda lime. Dr. H. W. FEATHERSTONE wondered whether soda lime which had been kept long, or was a poor sample, became dusty and so was liable to be absorbed as a fine powder into the lungs. Dr. I. E. HARRIES commented on the great variation in the facts as recorded by different observers. Closed anaesthesia had received a set-back in this country because of apparatus of incorrect design having been used. Carbon dioxide was the most important "hormone" in the body, and the most vital reaction was its excretion. Every attention should be given to perfecting the apparatus.

Dr. WATERS briefly replied, and concluded by showing a cinematograph film.

A mansion known as "Greycourt," at Riding Mill, Northumberland, standing in twenty acres of grounds, has been presented by Mr. Norman Newall of Fourstones to the Royal Victoria Infirmary, Newcastle-upon-Tyne, for conversion into a children's convalescent home in connexion with the infirmary.

England and Wales

Lord Moynihan's Bequests

It was announced in Leeds on October 1st that the gross estate of the late Lord Moynihan, who died on September 7th, was estimated to amount to £325,000. His bequests include £2,000 to the Royal College of Surgeons of England, to be applied to found an eponymous lectureship, and a legacy of £1,000 to the Leeds Medical School in memory of his mother, to establish an eponymous lecture to be given by some surgeon not connected with the University of Leeds, on any subject he may choose. Lord Moynihan had intended to bequeath £1,000 to the university for the founding of a scholarship in memory of his wife, who died a few days before his own death. This he wished to be given to the winner of the Hey gold medal, which had already been endowed by him. On the day after Lady Moynihan's death he instructed his solicitors to provide by codicil for this legacy. Lord Moynihan's family will carry out this wish, which death prevented him from making effective in his will.

West Riding Medical Charitable Society

Reference has been made in these columns on more than one occasion to the excellent work of the Medical Charitable Society for the West Riding of the County of York, and from the last annual report, which is in our hands, the work and the utility of the society seem to be steadily increasing. Founded in 1828 with a small number of subscribers, the society was not able for some few years to make the first of its grants. Great care and great economy had to be exercised, and even now, when its finances are in a highly satisfactory condition, this spirit of economy prevails, and the working expenses are limited to those involved in printing and the out-of-pocket charges of the honorary treasurer and honorary secretary, which are quite trifling. In 1921 the membership of the society was 862 ; for the year under review it was 1,258. The annual subscription is one guinea, and from time to time the merits of the society have led to various legacies being received. From these two sources of income it is remarkable that up to June, 1936, no less than £96,006 16s. had been expended in grants to necessitous persons whose claim for consideration depended upon the fact that they had been subscribers, or, much more usually, that a father or a husband had been in that position. At the annual meeting grants were made for this year of £2,518. Over a number of years the society has been able to invest considerable sums, and it now stands possessed of securities of the nominal value of £54,577 6s., for which it has paid £49,670 15s. 8d. The objects of the society are to help:

1. Any member who is disabled by illness or accident or age, and who has not adequate means of support.

2. The widow or children of a deceased member who may at any time require assistance.

3. The mother of any member, being a widow (or the sister being single or a widow) who had acted as his housekeeper for a period of not less than five years immediately preceding his death and who may at any time require assistance.

4. In the education of the children of members disabled by illness, accident, or age, or of deceased members, who at any time may require assistance for this purpose.

NOTE.—This clause shall be regarded as entitling the society, at its annual meeting, to make a grant to Epsom College for the purpose of contributing to the establishment of a scholarship or scholarships at the college, which would be open to the children of medical practitioners who are in straitened circumstances or who have died without leaving sufficient money to enable their children to be adequately educated, provided that notice of a motion to such effect is printed in the circular calling the annual meeting with a specification of the amount of the grant which it is proposed to make.

Since the above note was added five years ago a grant of £50 has been made each year to the funds of the college.

It is clearly understood by all the members of the society that no subscriber has any legal claim on the funds of the society, nor have those who make application in respect of the subscription of any member. Each application is taken on its merits. It is the case, however, that every member knows that if the time should, unhappily, come when he himself may require help, or when those whom he may have left without adequate provision for maintenance or for education may appeal to the society, all claims will be certain to receive kindly and sympathetic consideration from a responsible body of medical men. That there is no kind of antagonism between this excellent charity and that other charity of which the profession is so proud—the Royal Medical Benevolent Fund—is shown by the names of a very large number of subscribers appearing on the lists of both. Large though the number of the members of the West Riding Society is, one wonders why it is not even greater. On grounds of altruism, as well as on those of wisdom, everyone who is eligible ought to join. Particulars may be obtained from Dr. Wardrop Griffiths, Park Square, Leeds.

British Spas Federation

The British Spas Federation met recently at Woodhall Spa, and recorded its sense of loss by the recent death of Mr. F. J. C. Broome of Harrogate, one of the founders of the Federation, who worked devotedly for its aims as honorary secretary. Mr. John Hatton, spa director of Bath, who had previously occupied this position, was appointed to the vacant post. Three business meetings were held, and the developments recently carried out at Woodhall received critical examination and met with cordial approval. The members had an opportunity of hearing impressions of a recent visit to Continental spas. At few, if any, of the spas do the treatment establishments meet their working expenses, relying either on the sale of exported bottled waters or perhaps indirectly on the kurtaxe or the substantial assistance of the State. The speaker had been impressed by the use made of foreign spas, not only by those seeking relief in specific disorders, but by those who recognize the value of a course of spa treatment as an annual general tonic in middle age and approaching middle age. The importance of suitable entertainment for visitors in out-of-treatment hours was mentioned, as well as the tendency of Continental spas to become holiday resorts. The Government encouragement and recognition of the value of the spa had been of immense assistance in many Continental countries, and the spas in turn had been able to develop in such a way as to become still greater health assets to the community. The faculties in hydrology at French and other universities enabled medical students to appreciate the proper use and value of spa methods and the suitability of the various resorts to each particular case. Members were entertained to dinner at the Petwood Hotel by Sir Archibald Weigall, who, welcoming the guests, emphasized the value of co-operation, and the financial difficulties with which British spas, especially the smaller ones, were faced. Alderman Kidson of Harrogate said that in the Federation they had no rivalries, only the desire to make the spas of Great Britain the most efficient centres possible for health. Tribute was paid to the admirable arrangements made for the meeting by the director of the Woodhall Spa, Dr. G. Meredith Sanderson.

Course in Rheumatic Diseases

A special course of twenty-four lectures (free to the medical profession) on the rheumatic diseases will be held at the St. John Clinic and Institute of Physical Medicine, and the rheumatic unit, St. Stephen's Hospital, L.C.C., on Friday afternoons from October 23rd to December 18th, and from January 9th to April 23rd, 1937. The lectures will begin at 4.30 p.m., preceded by tea at 4 o'clock, and they will be illustrated wherever possible by demonstration of cases. The course will be opened by Sir

William Willcox, with Sir Leonard Hill, director of the clinic, in the chair. Others who will co-operate with the honorary consulting staff of the clinic are Dr. R. Fortescue Fox, Dr. R. G. Gordon of Bath, Dr. Leonard Findlay, and Dr. E. P. Poulton. With the approval of the chief medical officer of the London County Council the special unit at St. Stephen's Hospital for research on rheumatic diseases is being run with help by the staff of the St. John Clinic, and in this research the Lister Institute also is co-operating. In view of the grave and widespread ravages of acute and chronic rheumatism, and the large industrial invalidity due to these diseases, this course of lectures and demonstrations to review the whole subject is most timely. Copies of the syllabus may be had from the secretary, St. John Clinic, Ranelagh Road, S.W.1.

Presentation to Mr. R. C. Elmslie

The Founders' Lecture of the Chartered Society of Massage and Medical Gymnastics, delivered on September 25th, was preceded by a presentation to the lecturer, Mr. R. C. Elmslie, orthopaedic surgeon to St. Bartholomew's Hospital. Dr. James Mennell, chairman of the council of the society, in making the presentation on behalf of its members, reminded his hearers that Mr. Elmslie had been an original member of the council ; he had since served the society as chairman of the Examinations Committee for seven years, and also as chairman of the council. On his retirement from this office at the end of last year Mr. Elmslie was elected a vice-president of the society. The presentation consisted of a George II silver tankard, dated 1731, and two silver mugs, dated 1754 and 1756, together with a suitably inscribed silver tablet. After thanking the members for their gift and expressing his gratitude for this signal recognition of his long connexion with the society, Mr. Elmslie delivered the Founders' Lecture, choosing as his title "The Restoration of Function."

Ireland

Health in the Irish Free State

The Department of Local Government and Public Health of the Irish Free State, in its report for 1934–5, states that the death rate of 12.97 per 1,000 is the lowest ever recorded. The average figure for the previous decade was 14.39. Mortality was highest in the county boroughs, Cork and Dublin each showing over 17 per 1,000, and lowest in some of the counties on or near the western seaboard. A small decline is recorded both in the incidence and in the mortality of infectious diseases, the latter rate of 0.4 per 1,000 being the lowest in the annals of the country. The decrease in the incidence and mortality of diphtheria is attributed to a vigorous campaign of immunization. No case of small-pox has been reported in the Irish Free State since 1923, when a passenger from England arrived at Cobh suffering from the disease, and no death has occurred since 1907. This record compares very favourably with that of England, where the number of cases exceeded 2,000 in 1932 and 600 in 1933. There has, however, been a decline recently in the number of vaccinations performed in the Free State, which does not bode well for the future. Seventeen cases of typhus fever were notified, all of which occurred in rural districts. Conditions of poverty and overcrowding constituted the environment of each case. The most severe outbreak was in a mountainous district of County Wicklow, where in one isolated cottage fourteen people, all verminous, were living. Seven of these contracted the disease, and four cases ended fatally. It is interesting to note that typhus has been rare in Wicklow. The other cases, which were of mild type, came from Cork, Kerry, and Waterford, where the disease has been endemic in certain districts. In no case did the infection spread beyond the original focus. There was a marked increase in the incidence of typhoid fever, both rural and urban areas being affected. The most serious outbreak occurred in an educational establishment at Offaly, where there were sixty-five cases. Dispersal of the pupils for their holidays spread the infection widely over different parts of the country. Investigation showed that milk vessels had been washed in water piped from a certain stream. Into this stream had been emptied vessels and utensils from an adjacent cottage, where a case of tyhpoid fever had been notified a short time previously. There were sixteen cases at Castlebar, seven of which were reported from the mental hospital. Since the disease has repeatedly appeared in this institution during recent years the presence of carriers among the inmates was suspected, and a campaign of inoculation has been inaugurated. An outbreak of twenty cases at Castlerea, County Roscommon, was due to deliberate interference with the service reservoir by some people living under insanitary conditions, whose normal water supply had been cut off. The report points out that modern water supplies and sewerage systems, although closing many possible channels of infection, are potential vectors of mass infection when any accidental pollution takes place. It is also noted that the incidence of typhoid fever has been remarkably influenced by climatic conditions. When a dry period is followed by a period of heavy rain the water level rises in the wells, and accumulated surface and subsoil impurities gain access to the drinking water. For example, December, 1933, was dry ; January, 1934, was unusually wet. In the latter month twenty-five cases of typhoid occurred at Navan, and the infection was traced to contamination of a deep well by surface washings from a neighbouring yard.

The Health of Belfast

In the admirably lucid and informative report on the Health of the County Borough of Belfast for 1935 the medical superintendent officer of health, Dr. C. S. Thomson, discusses at some length the question of the smoke nuisance. In this respect the legal position in Northern Ireland is less satisfactory than it is in England, for the Belfast Corporation is only empowered to deal with the emission of black smoke. The report states that it is most desirable that an enactment similar to the Public Health (Smoke Abatement) Act, 1926, should be passed in Ulster, for black smoke is a rarity in comparison with the brown, grey, or yellow varieties. The relation between smoke and respiratory diseases is obvious, and it is not surprising that children whose inadequate ration of the ultra-violet rays of the sun during the winter months has been further impaired by atmospheric pollution should require such substitutes as cod-liver oil emulsion in February and March. The psychological aspect is also important, for in towns which are drab and dusty on account of smoke the mental outlook of the inhabitants tends to become gloomy and depressed. The requirements for the abolition of the smoke nuisance are two—the installation of boilers powerful enough not to require forcing, and the employment of mechanical stokers. The year under review has been an unfortunate one for Belfast with regard to infectious diseases, which caused 690 deaths, the rate of 1.5 per 1,000 being nearly double that of 1934. There were 1,201 cases of diphtheria, the largest number ever recorded ; 3,394 of scarlet fever, which has been increasing in recent years ; and 6,252 of measles as against 754 in the preceding year. In addition, an outbreak of typhoid fever in the autumn produced more than 100 cases. The infection was traced to a dairy, where two typhoid carriers were discovered. Belfast is to be congratulated on the efforts made towards mosquito control. Five men were selected from the labour exchange and were given some instruction in practical entomology. They were then assigned to the principal breeding grounds, where in the course of the summer they sprayed 3,424 gallons of paraffin and crude oil, and applied 557 gallons of larvicide (petroleum mixture). The results were most satisfactory, though complete elimination was impossible owing to the proximity of breeding grounds outside the city's control, whence some reinfestation unavoidably occurred. Steps have been taken to induce neighbouring local authorities to collaborate.

CORRESPONDENCE

Treatment of Tetanus

SIR,—I read with great interest Dr. Canwarden's report of two cases of tetanus cured by massive intravenous antitoxin in the *Journal* of September 12th (p. 539). In the first case the tetanus developed on the ninth day and took two days to develop, and the spasms were "never severe or frequent." In the second case the tetanus occurred eighteen days after the injury and only developed as far as risus sardonicus and trismus. So neither case was at all severe, and from the description given life was in no way menaced. Both were treated with massive doses of antitoxin, to the use of which the recovery was attributed. I noted a case in the *Evening Standard* of September 23rd, which developed on the ninth day and ended fatally.

As a student I remember Professor Caird telling us that if the disease developed within seven days of the receipt of the wound it would be fatal; if between seven and fourteen days about 50 per cent. would recover; and that between fourteen and twenty-one days more and more would survive the longer the incubation period, until after twenty-one days all would probably recover. The truth of these observations was amply borne out in my experience during the war, and I am unaware of anything that varied them in any marked degree. I tried most methods of treatment advocated—excision of the wounds, injection of antitoxins into veins and into the theca, and even division of the nerve plexuses. Nothing seemed to alter the principles which I had been taught; once the disease obtained a hold nothing seemed to influence it. I should be very interested to know if this view is generally held and what the official figures really were.—I am, etc.,

London, W.1, Sept. 25th. DUNCAN C. L. FITZWILLIAMS.

"Bejel": Non-venereal Syphilis

SIR,—I was most interested to read in the *Journal* of October 3rd (p. 684) the account of Dr. E. H. Hudson's descriptions of a non-venereal syphilis in the Middle Euphrates River region, the disease being locally known as "bejel." From the description I judge it possible that this is the same disease which for some time we have met at Aden, and which I have lately taken to calling "Z-syphilis," as the district in which it flourishes is called Zabeed.

As we do not have access to this district, data are only those secured from sufferers who come to Aden for medical advice; but, for comparison with the observations of Dr. Hudson, the most notable feature of "Z-syphilis" is its uniform attack upon the nose, usually in the second or third decade of life. Intractable ulceration, if left to itself, makes the patient's life a misery by foul taste and smell, erodes the nose, and in several cases that I have seen has removed the nose entirely, together with its septum and the soft palate. The salvarsan group of drugs acts like magic. Bones are commonly affected, especially long bones, and in one case, arms, forearms, thighs, and legs all bore signs of healed pathological fracture, and one leg had to be amputated owing to septic compound pathological fracture. A gaping hole in the centre of the face replaced the nose. This case was demonstrated by me to the Aden Branch of the British Medical Association in 1935. The sigma reaction in such is unusually strongly positive. Probably the parallel with Dr. Hudson's cases is more complete than appears, for cases contracted in childhood and spontaneously cured in Zabeed would not be seen by us, nor would early stages. Very probably this variety is non-venereal.

This Z-syphilis almost exactly corresponds in distribution with schistosomiasis and with the denser areas in the distribution of leprosy, but the last-named extends in scattered groups more widely than the other two, according to the records of the Church of Scotland Hospital. There is no evidence that the same person is attacked by more than one of the three diseases, but the question of what peculiar local factor (if any) assists all three ought to have serious research. It is interesting to note that venereal syphilis in the Euphrates region is called "franghi"—that is, European. With us it is called sea-sickness, which implies the same debt to Western "syphilization."—I am, etc.,

October 3rd. ROBERT NAPIER.

Diphtheria Immunization by Alum-precipitated Toxoid

SIR,—In a letter of mine which appeared in the *Journal* of November 16th, 1935, I stated that I had met with no failure to obtain a Schick-negative result three months after a single injection of 0.5 c.cm. A.P.T. in 197 cases.

The next series of 297 cases treated similarly were disappointing, inasmuch as 9.8 per cent. were definitely Schick-positive and 8.8 per cent. slightly positive—a total of 18.6 per cent. All except one of these cases that reattended were rendered Schick-negative after a further dose of 0.25 c.cm. One of the three infant schools comprising this series gave a posterior Schick-positive rate of 29 per cent., a wholly inexplicable result. A third series, comprising some one thousand children under 8 years of age, are now awaiting their posterior Schick tests. In view of the high Schick-positive rate following a single injection of A.P.T., a further series of 100 children under 8 years of age has been treated with two doses of A.P.T.—that is, 0.1 c.cm. followed in fourteen days by 0.4 c.cm. There has only been one failure to secure a negative posterior Schick result in this series.

To sum up: posterior Schick-testing cannot be dispensed with after using A.P.T. by the "single-shot" method. The method of choice with this prophylactic appears to be the administration of two doses (totalling 0.5 c.cm.) as set out above.—I am, etc.,

A. POWELL,
Medical Officer of Health.

Public Health Department, Walthamstow, E.17, Oct. 2nd.

Anaemia of Pregnancy

SIR,—In his excellent paper opening the discussion upon this subject at the Oxford meeting in July (*Journal*, September 19th, p. 573) Dr. Carey Smallwood emphasizes the frequency of mild degrees of hypochromic anaemia in pregnancy; at the same time he states that the condition is seldom "dangerous to life." I believe this to be a serious understatement. Elsewhere I have described several cases in which such anaemia was the only factor to be found in severe—sometimes even fatal—obstetric shock. I have also collected several cases in which hypochromic anaemia in pregnancy was associated with accidental haemorrhage, and one of these at least narrowly escaped a fatal issue. Surely, also, it is generally admitted that such cases are much more prone to puerperal infection, particularly that caused by *B. coli communis*, again making the anaemia not infrequently "dangerous to life." I was disappointed also that the "masking" of this type of anaemia was not stressed. Many patients have almost perfect colouring, so that without at least an estimation of haemoglobin it is impossible to diagnose the condition.—I am, etc.,

DOUGLAS A. MITCHELL,
M.D.Lond., F.R.C.S.Ed., M.C.O.G.

Bath, Oct. 2nd.

Cervical Gland Tuberculosis

SIR,—The debated point as to the value of surgery has interested me for almost forty years, but even now I should hesitate to generalize; so much depends on technique and an appropriate selection of cases.

For example, a patient of mine, in her early teens thirty-six years ago, suffered from tuberculous cervical glands with a comparatively high temperature while under observation for two months or so. The glands were then excised by the late Mr. F. A. Southam, F.R.C.S., with the result that the temperature was normal in a few days and there was sound primary union. This patient is in excellent health at present. One cannot imagine any other form of treatment giving a result at once so rapid and satisfactory. On the other hand, a little girl of 8 or 9 had had several (I think at least three) operations at the Manchester Northern Hospital when she was referred to a clinic for which I was at the time responsible. Several discharging sinuses, considerable superficial ulceration, and a very poor general condition made the outlook discouraging. She was treated with tuberculin (B.E.) in addition to the routine tonics already prescribed. The sinuses had ceased to discharge, the superficial ulceration had almost completely healed, and her general condition had notably improved in a little over a year. Probably surgery was harmful rather than helpful in this case. Her subsequent history I do not know.

I have also met with one or two cases in which there was a suspicion that surgical treatment had done serious harm; but such happenings are certainly rare, and are perhaps only coincidences. None the less, the theoretical possibility of dissemination should, I think, be kept in view when selecting cases for operative treatment.—I am, etc.,

Manchester, Oct. 5th. J. STAVELY DICK.

SIR,—The letters in the *Journal* of October 3rd (p. 692) show that others than myself are of opinion that Dr. Brian C. Thompson (September 19th, p. 584) has been more unfortunate in his surgical experiences than many of us who practise in the South of England. There has been so great a diminution in the incidence of this form of surgical tuberculosis, at all events in the metropolitan area and the southern counties, that statistics showing a sufficient number of cases would have to go back to the years before the war; but the results of Dr. C. A. Dowd, as quoted by Mr. Hamilton Bailey, are much more in accord with our experience than the melancholy reading to be found on page 586.—I am, etc.,

Margate, Oct. 3rd. W. GREENWOOD SUTCLIFFE.

Sporadic Typhoid Fever: A Source of Infection

SIR,—I feel convinced that a far larger number of sporadic cases of typhoid fever are due to contamination of food through the dirty hands of carriers than is generally thought. Articles of food pass through the hands of so many people that it is almost impossible to trace where the infection arose. In the case of epidemics of typhoid it is comparatively easy to trace the infection, but it is not so in sporadic cases.

It is well known that nurses in hospitals not infrequently contract typhoid fever from their patients, and the same occurs where the patient has been treated at home, some of the attendant relatives contracting the disease. In these cases it is not difficult to trace the infection, the hands having become soiled through touching the patient or his soiled bedclothes. It is a very difficult matter, however, to trace the source of infection when the active agent is a carrier who is manipulating articles of food. As the typhoid bacilli are excreted solely in such an individual by the bowels and bladder, such a method of transmission throws much light on the filthy habits of our people.

If it is so difficult to recognize carriers, are we to consider ourselves helpless in the matter? I do not think so. Let us recognize at once that it is impossible to clean the anus by merely rubbing it with paper. In fact, such a procedure merely distributes faecal matter over a wider area. To clean the anal orifice even in a cursory manner requires the application of soap and water. If, however, each individual kept a sponge, cotton waste, or even a rag for the purpose and made use of plenty of soap, the parts become so clean that there is little risk of the clothing becoming infected. (It is well known that the hands may become in this way the means of conveying infection from soiled clothing to food.) This local ablution should be the routine practice after every act of defaecation carried out by everyone who desires to attain even a measure of personal cleanliness. Were this procedure taught to children, it would soon become a habit as constantly employed as cleaning the teeth. Far more important than this, however, is the thorough washing of the hands by everyone after each act of defaecation. We know not how large the number of carriers may be. It is only those who have infected many who become suspect and so identified. The individual who infects but one or two escapes attention, and yet the number of such may be very large.

We cannot compel the ordinary members of the community to make use of these elementary hygienic precautions which I have indicated, but we could, and I think most certainly should, insist on these being employed in every public building (factory, bakehouse, hotel, etc.) where articles of food are touched by human hands and then consumed without further treatment. There are abundant provisions in the Factory and Workshop Acts for preserving the health of the workpeople themselves, but few of these are applicable to the health of those outside. It should be made compulsory that in every building where food for human consumption is manipulated each water-closet should have a hand-basin with running water, soap, nail-brush, and towel installed, and that these should be made use of by every work-person after defaecation (an inspection of the hands will show if this has been done properly) or urination, and before handling any article of food.

It is only by taking such precautions that the danger of infection through food can be got rid of. At first it might be troublesome and perhaps difficult to instil into the minds of operatives the absolute necessity for these acts of personal cleanliness; but in a short time it would not only become habitual but also universal, and we would not be (as we are at present) the reproach of some of our Eastern friends, who are amazed at our dirty habits in not washing either hands or anus after a call of nature has been attended to. We are quite aware that these acts are rather unpleasant incidents in our daily life, but they do not supply any reason why in so many instances the water-closet is such an uninviting chamber. It is too often a dark, dirty, unplastered closet placed as far away as possible, whereas it ought to be a well-lighted and well-ventilated chamber, lined with bright tiles or cement, having a wash-hand basin and being of easy access.

Another reason why the anus should be washed after each defaecation, and one which is perhaps more important to the general public, is that it removes faecal matter from the anal folds. If left there it acts as an irritant, inducing pruritus ani and haemorrhoids. These diseases are seldom or never present in those who practise this local cleansing.—I am, etc.,

W. G. AITCHISON ROBERTSON, M.D.,
Bournemouth. F.R.C.P.Ed., Barrister-at-Law.

Maternal and Infant Mortality

Sir,—It is a great pity that Dr. Hirschmann (September 26th, p. 650) employs his eloquent pen in abuse of the maternity and child welfare centres. He can be assured that digital or instrumental vaginal examination is not carried out as a routine part of every ante-natal examination. There are definite indications for such investigation, chiefly in cases of disproportion (Munro-Kerr's manœuvre) and to determine the cause and nature of a vaginal discharge. No experienced doctor in an ante-natal clinic wastes his time or inconveniences his patient by attempting to ascertain degrees of pelvic contraction by vaginal examination without anaesthesia. On the other hand, in spite of Dr. Hirschmann's sweeping indictment of the "gentle" vaginal examination, no conscientious clinic doctor will omit to carry out such investigation when the indications are present.

From my own experience, over a period of seven years, as resident in a hospital dealing with 600 births annually, I can truly state that the cases coming into hospital after ante-natal care at the clinics gave little or no trouble. Those with disproportion, toxaemias, or general diseases likely to complicate labour were diagnosed in good time at the clinics, and I had a fair chance to deal with them on classical lines. It was quite another story with the cases sent in by local general practitioners. "Failed forceps" with a mutilated foetus and bruised and lacerated maternal parts were all too common, and cases of advanced pregnancy toxaemias, frankly neglected by the general practitioner, when the signs and symptoms of impending disaster were present for all to read. Surely the boot is on the other foot, and the clinic doctor must feel more responsibility towards his patient than the general practitioner who "has a go" first and then turns his poor victim over to a hospital.

In regard to Dr. Hirschmann's second statement—that the infant welfare centres are a contributory cause of infant mortality—I cannot deny that many of the old church halls and buildings in which these clinics are held are utterly unsuited to the purpose. But local authorities are well aware of these difficulties, and well-built, properly warmed buildings are being erected all over the country. I hold child welfare clinics almost every day, and can assure Dr. Hirschmann that I have never had a child "completely undressed" in my consulting room. From my experience I would say the method of procedure at these clinics approximates to that employed in many of the children's departments of the voluntary hospitals, and nobody has yet accused these institutions of contributing towards the maintenance of a high infant mortality.—I am, etc.,

J. Stanley Coleman, M.B., B.S.

Children's Homes, Aldersbrook,
Wanstead, E.11, Sept. 28th.

Sanatorium Treatment in England

Sir,—In the *Journal* of September 12th (p. 557) there appeared a short article under the heading "Dr. Noel Bardswell," referring to his coming retirement. This article states: "At the time of his appointment in 1905 by the Metropolitan Asylums Board as medical superintendent of King Edward VII Sanatorium, Midhurst, sanatorium treatment was, practically speaking, not to be obtained in England, and tuberculosis patients were generally sent to sanatoria in Germany, Switzerland, and such places as Madeira." This statement, I suggest, is quite erroneous and cannot be substantiated.

I believe G. Bodington started open-air treatment of consumption at Sutton Coldfield in 1840, but he failed to win acceptance for his views. The actual adoption and beginning of open-air treatment in this country dates from the 'nineties. The county of Norfolk was its venue, and Drs. Jane Walker and F. W. Burton Fanning its two pioneers. Stated chronologically sanatorium treatment was started:

1. Downham Market, 1892, Dr. Jane Walker.
2. Cromer Convalescent Home, 1895, Dr. F. W. Burton Fanning. (Special shelters in the grounds, with revolving mechanism, designed by Dr. F. W. Burton Fanning and the late Dr. W. J. Fanning, which has not been altered since it was originally designed.)
3. Linford Sanatorium, 1897, Drs. R. Mander Smyth and H. G. Felkin.
4. Cotswold Sanatorium, 1898, Dr. S. T. Pruen.
5. Mundesley Sanatorium, 1899, Dr. F. W. Burton Fanning.
6. Nordrach-on-Mendip Sanatorium, 1899, Dr. W. R. Thurnham.
7. East Anglian Sanatorium, Nayland, 1901, Dr. Jane Walker.
8. Kelling Sanatorium for poor patients, 1903, Dr. F. W. Burton Fanning. (With money given on account of a patient treated at Mundesley Sanatorium.)
9. Maltings Farm, Nayland, 1904, Dr. Jane Walker.

It is thus apparent that the first trials of open-air treatment for the consumptive began in a house at Downham and in a convalescent home at Cromer. From these two tentative establishments in Norfolk there sprang the Mundesley Sanatorium in 1899 and the East Anglian Sanatorium, Nayland, in 1901.

In common with very many other medical men I would be glad if you could, through the medium of the *Journal*, bring about a long-overdue recognition of fine pioneer work, resulting in untold benefit to the consumptive, and to establish the claims of Drs. Jane Walker and Burton Fanning, the first two doctors in this country to start sanatorium treatment. I feel confident that neither of these two pioneers would ever attempt to "stake claims," but "an unbeaten gong gives no sound."—I am, etc.,

Burgess Hill, Oct. 1st. S. Gurney Champion.

Mechanized Medicine

Sir,—What we write, I believe, in the majority of cases, is a reflection of our own practice, of our own conception of what is right and what is wrong, and of our own ideals. Dr. Taylor-Thomas, in your issue of September 12th, imagines a conversation between a British national health insurance physician and his patient, and he bases his arguments against British national health insurance and in favour of his proposed revolution of medical practice upon this picture which he, without any experience of what he is writing about, has evolved. That he would do such a thing, in my opinion, places him pretty far down in the C grade of his own scheme. Now in your issue of September 26th, we have an individual, who at least has the sense to sign his letter by a pseudonym, applauding Dr. Taylor-Thomas apparently on the grounds that he, "Juvenis," rushes through the examination of his patients without proper care, because he, through apparently gross carelessness or ignorance, lately diagnosed two carcinomata of the stomach too late, and labelled a case of pulmonary tuberculosis as a neurotic, and, worst of all, because he and his chief, the latter receiving public money under definite conditions of service, fail to carry out their agreement with their Insurance Committee.

I have been chairman of the Ross and Cromarty Insurance Committee for several years. I have also been chairman of the Ross and Cromarty Panel Committee for many years, and my index list is one of the largest in this area. I should thus know something of national health insurance practice, its good qualities and its bad qualities. We are not to judge the character of the British citizen by that of the inmates of Dartmoor Prison, and I would ask you not to judge our national health insurance practice by the imaginings of Dr. Taylor-Thomas, or by the confessions of "Juvenis" and his kind. In the large majority of cases national health

insurance practice is of a very high standard, and is not second to the standard of efficiency and rectitude attained by any other profession or business ; otherwise, would it for one moment be tolerated by the public? Let us as medical practitioners serve others as we expect other professional and business men to serve us ; let us not, in the size of our index list, take on more than we can efficiently look after ; let us, in our reading, keep abreast of the times ; and let us keep careful notes of the essentials of our cases so that we may learn to help our patients by a contemplation of both our failures and our successes. If we do this the periodic and ignorant vapourings of those who judge us to our detriment by their own standard may be treated with the contempt which they deserve.—I am, etc.,

Tain, Sept. 26th. E. K. Mackenzie.

Sir,—As Dr. Alfred Cox says, the matter is of great importance. As such it merits a much more accurate exhibition of the facts than appears in Dr. Cox's letter. Assuming his figures to be correct, let us go further than Dr. Cox and see what they mean.

Eighteen visits a day, allowing fifteen minutes a visit, means four and a half hours a day ; thirty surgery services a day, allowing five minutes each, means two and a half hours a day, a total of seven hours a day. A nice easy day's work. But Dr. Cox makes no allowance for midwifery (about forty cases a year in a practice such as we are considering), accidents, insurance examinations, anaesthetics, or operations. Allowing for these etceteras there is still no rush.

But here Dr. Cox strays from the track of facts after that attractive statistical mirage—averages. He averages his figures over a whole year, whereas even in the best organized practice roughly two-thirds of the year's work is crammed into six months. Let us examine this period of six months on the basis of Dr. Cox's figures. Twenty-four visits at fifteen minutes means six hours a day. Forty surgery services at five minutes means three hours twenty minutes a day. A total of nine hours twenty minutes a day, with no allowances for midwifery or other etceteras. Thus Dr. Cox's own figures suggest that a rush is probably a normal state in general practice for a considerable portion of the year. Most general practitioners are only too aware of this uncomfortable period when patients, panel and private, and their medical attendants suffer from the rush of work. Dr. Cox and the travellers in statistics from the Ministry of Health appear to be uninformed of this rush period, or rather of the length of its duration.

Again, assuming Dr. Cox's figures to be correct, we find that an attendance on a panel patient is valued at rather less than two shillings. The remedy for this unsatisfactory state of affairs, as was pointed out a fortnight ago, is a revision of fees, both private and panel.

Dr. Cox will forgive my candour when I point out that he has, unconsciously I am sure, given a handle to those who prefer to shut their eyes to unpleasant facts and prefer the *status quo* to an increase in the efficiency of both panel and private practice.—I am, etc.,

Penzance, Oct. 4th. R. N. Porritt.

Sir,—With regard to the letter of Dr. Alfred Cox in the *Journal* of October 3rd, it is pleasing to learn that he appears to be quite satisfied that " panel " practitioners as a rule render a " good general service " to their panel patients. One wonders whether or not Dr. Cox is quite satisfied that the doctors receive an adequate remuneration for this " good general service," as it would appear to be more or less the consensus of opinion that the doctors themselves are not satisfied with their remuneration.—I am, etc.,

October 5th. D. H. S.

Obituary

Dr. William Henrie Crawford Clarke died at Milford, Co. Donegal, on August 28th at the age of 71. He was educated at Raphoe Royal School, and studied medicine at the Royal College of Surgeons, Dublin, and the Royal City of Dublin Hospital. After qualifying in 1888 as L.R.C.P. and S.I. he spent some time as ship surgeon, during which he visited America several times. He was appointed medical officer to the Milford Dispensary District in 1893, a post which he held for forty-two years, until compelled by ill-health to retire in 1935. He was also medical officer to the Milford workhouse and fever hospital until the centralization scheme in 1922. He had been a member of the British Medical Association since 1893. Dr. Clarke was a man of the highest integrity, sound common sense, and a strong personality, but his outstanding characteristic was his remarkable charity and kindness to the poor. He had a fine record of service, and will long be affectionately remembered by the people of the Milford district amongst whom he worked. He is survived by his widow, one son, and three daughters, with whom deep sympathy is felt.

We regret to record the death on September 14th of Dr. Archibald Ferguson, medical officer of health for the metropolitan borough of Stepney. He was born at Burnley on January 21st, 1887, the son of Dr. J. M. Ferguson, past-president of the Lancashire and Cheshire Branch of the British Medical Association. From Epsom College he went to St. Bartholomew's Hospital, qualifying M.B., B.S.Lond., and M.R.C.S., L.R.C.P. in 1912, and obtaining the D.P.H. of the English Conjoint Board in the following year. During the war he served for three years as temporary captain in the R.A.M.C., and published a series of reports on the Whitechapel Tuberculosis Dispensary, of which he became senior medical officer. In July, 1930, he was appointed deputy M.O.H. for Stepney, and three years later succeeded to the senior office. Dr. Ferguson was for many years tuberculosis consultant to St. Peter's Hospital, Stepney, and had been medical officer to the Stepney and Mile End Dispensary for the Prevention of Consumption. He joined the British Medical Association in 1914. A memorial service was held in Whitechapel Parish Church on Sunday, September 27th ; it was conducted by the Rev. Prebendary J. A. Mayo, rector, and the mayor and mayoress of Stepney attended, with members and officials of the borough council.

The sudden and quite unexpected death, on September 25th, of Dr. Archibald Gillespie of Sutton-on-Hull, at the comparatively early age of 55, has come as a great blow not only to his friends and patients, but to the whole of the profession in the East Riding of Yorkshire. Dr. Gillespie studied at St. Andrews and Edinburgh Universities, taking his M.B. at the latter in 1902, and proceeding to the M.D. in 1906. After resident appointments at Bridgwater Infirmary and Hull Royal Infirmary, and a period of two years as assistant in a general practice in Hessle, he started practice in Sutton. He soon became the trusted adviser of the large rural district surrounding Sutton, and being appointed M.O. of the No. 9 District of the Sculcoates Union he also acquired a large practice in the residential district in the east of Hull. In 1929 he was chairman of the East Yorkshire Branch of the B.M.A., and previously had been president of the Hull Medical Society ; he filled both posts with dignity and much acceptance to his fellow practitioners. He acted as secretary to the Panel Committee of the East Riding Insurance Committee from its inception, and his thorough grasp of health insurance matters was of the greatest value to his brother practitioners and the means of him becoming widely known among the medical men of the whole of the area. Panel practitioners requiring guidance in any difficulty could always be sure of ready help and sound advice. He was a member of the committee of the Hull Jubilee Nurses, and latterly was chairman of the

committee inaugurating the Hull Public Medical Service. A hard worker, he yet found time for occasional relaxation, being a good shot, a keen fisherman, and a good golfer. During the war he was M.O. to the 3rd Division Ammunition Column, and saw much service in Belgium and France. The district is the poorer by the death of one of the best kind of practitioners—a public-spirited, self-reliant, all-round man of sound judgement and ripe experience, with a kindly disposition and a keen sense of humour. He leaves a widow and four daughters.

Dr. JOHN DAWSON, who died in a nursing home on September 25th, had practised at Dudley Hill, Bradford, before removing to Horsforth. He was born in 1877 and received his medical education at Queen's College, Cork, qualifying in 1905 as L.R.C.P. and S.Ed., L.R.F.P.S.Glas. Dr. Dawson joined the Bradford Division of the British Medical Association in 1911, and was also a member of the Bradford Medico-Chirurgical Society.

Dr. OWEN TRAFFORD OWEN, who recently died at the age of 80, had been in practice at Blackburn longer than any other member of the profession there. An Edinburgh student, he graduated M.B., C.M. at the University in 1890, proceeding M.D. in 1924. He was a member of the British Medical Association for forty years. In his early days of practice Dr. Owen paid his round of visits on horseback ; later he had a dogcart, and then a brougham. For some time he was an active worker for Epsom College, acting as local honorary secretary and treasurer ; and he was a member of the Blackburn Medical Society and of the Manchester Clinical Society. During the war he served as civil surgeon to Queen Mary's Military Hospital, Whalley.

We regret to record the death on October 1st at his residence in Cricklewood of Dr. ABRAHAM COHEN, who was born in 1853 and became a member of the British Medical Association in 1880. He received his medical education at Trinity College, Dublin, and University College, London. He graduated M.B.Dublin in 1879, and B.Ch. in the following year, and in 1882 proceeded M.D. He held the posts of physician to Jewish outpatients at the Metropolitan Hospital and of honorary medical officer to the Jewish Ministers' Training College. His earlier appointments included those of senior house-surgeon and house-physician to the Metropolitan Hospital, and honorary medical officer to the Jewish Convalescent Homes at Brighton and Norwood. He contributed to the medical press on occasion in his earlier professional life, and was the author of a treatise on the vitality of the Jews, their cosmopolitanism, and their comparative immunity from various diseases. Other topics on which he wrote were the influence of circumcision in the prevention of syphilis and other diseases. He was buried in the Willesden Jewish Cemetery on October 4th.

The following well-known foreign medical men have recently died: Dr. JACOB PAL, professor of clinical medicine at Vienna and author of works on pharmacology, experimental pathology, neurology, and internal medicine, aged 70 ; Dr. FRANCIS HENRY WILLIAMS, a pioneer in the development of *x*-ray and radium therapy, and formerly senior physician to Boston City Hospital, aged 84 ; Dr. CAMPBELL PALMER HOWARD, professor of medicine at the McGill University faculty of medicine, Montreal, aged 59 ; Dr. LOUKIANOFF, professor of general pathology at the Leningrad Medical Post-Graduate Institute ; Dr. K. M. NADKARNI of Mangalore, founder of the first monthly medical review in Bombay, entitled *The Doctor's Magazine*, and subsequently founder of the *Indian Medico-Chirurgical Journal*, aged 72 ; Dr. CARL GROUVEN, professor of dermatology at Halle, aged 64 ; Professor JOHANNES WERTHER, a prominent Dresden dermatologist, aged 72 ; Geh. Med.-Rat Dr. JOSEF MEIER, an eminent paediatrist of Munich, aged 70 ; Dr. PAUL MORAWITZ, professor of internal medicine and director of the Medical Clinic at Leipzig University, aged 57 ; and Dr. GUGLIELMO ROMITI, emeritus professor of anatomy at Pisa.

Universities and Colleges

UNIVERSITY OF LONDON

The Semon Lecture, on "Some Tumours and Ulcers of the Palate and Fauces," will be given by Mr. Walter Howarth at the Royal Society of Medicine on November 5th, at 5 p.m., and the chair will be taken by Mr. Lionel Colledge. The lecture is to be illustrated by lantern slides.

A course of five Heath Clark Lectures, on "The Development of Bacteriology, with an account of some of the Pioneers who made it a Science," will be given by Professor William Bulloch at the London School of Hygiene and Tropical Medicine on November 16th, 18th, 23rd, 25th, and 27th, at 5.30 p.m.

A course of three lectures, on "The Ovarian Hormones," will be given by Dr. George W. Corner, Professor of Anatomy in the University of Rochester, U.S.A., at Guy's Hospital Medical School on December 7th, 8th, and 9th, at 5.30 p.m. The chair at the first lecture will be taken by Professor E. C. Dodds.

Admission to the above-named lectures is free, without ticket.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Museum Demonstrations

The autumn course of museum demonstrations in the theatre of the College commences on Monday, October 19th, when Mr. L. W. Proger will speak on intestinal diseases, and he will deal with the same subject on October 26th and November 2nd. On October 23rd Mr. A. J. E. Cave will discuss the nature of various fasciae, on October 30th he will speak on the inguinal canal and its herniae, and on November 6th on the anatomy of abdominal herniae. All the demonstrations commence at 5 p.m. and are open to advanced students and medical practitioners.

The Services

PARKES MEMORIAL PRIZE

Changes have recently been made in the conditions governing the award of the Parkes Memorial Prize, consisting of about 30 guineas in money with a gold medal. It may now be awarded annually, in December instead of every third year, to the officer whose work in promoting naval or military hygiene is adjudged to be of outstanding merit. Any medical officer of the Navy, Army, or Indian Army on full pay will be eligible for consideration for the award except professors or assistant professors of the R.N. Medical School, Greenwich, and the Royal Army Medical College, London, during their terms of office.

DEATHS IN THE SERVICES

Brevet-Colonel Charles John Willmer Tatham, O.B.E., R.A.M.C. (retired), died at Long Melford, Suffolk, on September 12th, aged 75. He was born at Dallington, Sussex, on November 5th, 1860, was educated at King's College, Cambridge, and at King's College Hospital, and took the M.R.C.S. in 1883, the L.S.A. in 1884, and the D.P.H. of the London Colleges in 1894. Entering the Army as surgeon on July 28th, 1886, he became lieutenant-colonel after twenty years' service, and retired on August 11th, 1906. From 1906 to 1909 he was employed on the retired list at Scarborough. He served in the South African War from 1899 to 1902, in Cape Colony, chiefly in embarkation duties at Capetown, and received the Queen's medal with a clasp and the King's medal with two clasps. On August 5th, 1914, he rejoined for service in the war, when he was employed as A.D.M.S. in the Northern Command, and received a brevet colonelcy on June 3rd, 1917, and the O.B.E. He leaves a widow, who is a J.P. for Suffolk, and one daughter. He joined the British Medical Association in 1887.

Lieutenant-Colonel Robert James Leech Fayle, D.S.O., R.A.M.C. (retired), died on July 6th, aged 79. He was born at Parsonstown, King's County, on April 1st, 1857, was educated in the School of the Royal College of Surgeons, Ireland, and took the L.K.Q.C.P. and L.R.C.S.I. in 1881. Entering the Army as surgeon on February 4th, 1882, he became lieutenant-colonel after twenty years' service, and retired on October 29th, 1902. He served in the South African War from 1899 to 1902, taking part in operations in the Orange Free State, including the relief of Kimberley, was mentioned in dispatches in the *London Gazette* of April 18th, 1901, and received the Queen's medal with three clasps, the King's medal with two clasps, and the D.S.O. On June 17th, 1915, he rejoined for service in the war of 1914–18.

Medical News

The inaugural address at Guy's Hospital Medical School on "The Doctor and his Horizon" will be delivered by Viscount Dawson of Penn, President of the Royal College of Physicians, on Monday, October 12th, at 3 p.m.

The opening address for the new session at the Welsh National School of Medicine will be given by Dr. John S. Fairbairn in the Institute of Physiology, Newport Road, Cardiff, on Tuesday, October 13th, at 5 p.m. His subject is "Constructive Hygiene in Obstetrics."

The first triennial Joseph Strickland Goodall Memorial Lecture on Cardiology will be delivered by Dr. John Hay of Liverpool on Wednesday, October 14th, at 9 p.m., at Apothecaries' Hall, Water Lane, Queen Victoria Street, E.C. Members of the medical profession are invited.

Sir StClair Thomson will deliver an address on "A House-surgeon's Recollections of Lord Lister" before the Listerian Society of King's College Hospital, at the hospital, Denmark Hill, S.E., on Wednesday, October 14th, at 8.30 p.m. All members of the medical profession, and especially students of the history of medicine, are invited to attend.

The President (Sir Ewen Maclean) and the Council of the British College of Obstetricians and Gynaecologists have issued invitations to a dinner on the evening of Friday, October 23rd, at Claridge's.

The annual dinner of the Chelsea Clinical Society will be held at the Rembrandt Hotel, Thurloe Place, on Tuesday, October 20th, at 7.30 for 8 p.m.

The annual dinner of the Surgical Instrument Manufacturers' Association will be held at the Holborn Restaurant on Friday, October 16th, at 6.30 for 7 p.m.

The annual dinner of past and present students of King's College Hospital Medical School will be held at the May Fair Hotel on Saturday, October 24th. The annual post-graduate course will be given in the medical school on Saturday and Sunday, October 24th and 25th.

The seventeenth Norman Kerr Memorial Lecture will be delivered before the Society for the Study of Inebriety by Professor D. K. Henderson, physician-superintendent of the Royal Edinburgh Hospital for Nervous and Mental Diseases, and professor of psychiatric medicine in the University of Edinburgh, on Tuesday, October 13th, at 4 p.m. at Friends House, Euston Road, N.W. His subject is "Alcoholism and Psychiatry." Each member and associate is at liberty to introduce visitors.

To meet the growing interest among parents, teachers, and others in the psychological approach to the treatment of children's nervous ailments, a series of ten public lectures on mental health in childhood will be given during the winter at the Institute of Medical Psychology, Malet Place, W.C. The series begins on October 14th. Other lectures include a course of four in elementary mental testing, beginning on October 21st.

A course of lectures and study group discussions on "Advances in Understanding Causes of War" has been arranged at Friends House, Euston Road, N.W., beginning on Monday, October 12th. Dr. Graham Howe will give the first six lectures. Details of times, fees, etc., may be had from the general secretary, Home and School Council of Great Britain, 29, Tavistock Square, W.C.1.

A sessional meeting of the Royal Sanitary Institute will to be held at Norwich Guildhall on Saturday, October 17th, at 10 a.m., when discussions will take place on "Cultural Methods for the Isolation of Tubercle Bacilli in Milk," to be opened by Dr. T. Ruddock-West; and on "The Shops Acts, 1912–34, and their Application to the City of Norwich," to be opened by G. D. Kirby.

The British Institute of Philosophy announces that an address entitled "On Being a Philosopher" will be given by Professor H. F. Hallett at University College, Gower Street, at 8.15 p.m., on Tuesday, October 13th. Cards of admission can be obtained from the Director of Studies at University Hall, 14, Gordon Square, W.C.1.

The opening meeting of the Illuminating Engineering Society will be held at the Lighting Service Bureau, 2, Savoy Hill, Strand, W.C., on Tuesday, October 13th, at 4.30 p.m., when exhibits illustrating developments in illuminating engineering will be open for inspection and the report on progress by the Technical Committee will be presented.

The programme for the new session of the Institution of Heating and Ventilating Engineers has now been issued, and copies may be had from the secretary, 12, Russell Square, W.C.1. At the autumn special meeting on Tuesday, October 13th, Mr. T. Bedford, B.Sc., Ph.D., will read a paper on "Warmth and Comfort," at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.

The following meetings of the Eugenics Society will be held at the Linnean Society's Rooms, Burlington House, Piccadilly, W.: Tuesday, October 20th, 5.15 p.m., Dr. Eliot Slater, "The Inheritance of Mental Disorder"; Tuesday, November 17th, 5.15 p.m., Mr. W. T. J. Gun, "The Heredity of the Royal Caste"; Tuesday, December 15th, 5.15 p.m., Wing Commander A. W. H. James, Dr. Caroline Maule, and Mr. J. Verney Quilliam, "Voluntary Sterilization: The Work of the Past Year." All interested in the above subjects are invited to attend.

The following programme for 1936–7 has been arranged by the Hunterian Society: October 12th, Presidential address by Mr. H. L. Attwater, "Reflections in the Cystoscope." November 16th, Debate: "That the Practice of Voluntary Euthanasia would be Unjustifiable." Speakers, Dr. G. Roche Lynch, Canon Anson, Mr. Gilbert Ryle, Sir Walter Langdon-Brown, and Dr. C. Killick Millard. December 14th, Discussion: "Frequency of Micturition in the Adult." To be opened by Mr. Alex. E. Roche and Dr. D. E. Denny-Brown. January 18th, Hunterian Lecture by Dr. J. Schoemaker (The Hague), "Surgery of Gastro-duodenal Inflammation." February 17th, annual dinner. February 22nd, Hunterian Oration by Lord Horder, "The Hunterian Tradition." March 15th, Discussion, "Gastro-enteritis in Children." To be opened by Dr. A. G. Maitland-Jones and Dr. L. Mandel. April 12th, annual general meeting.

The fourth Congress of the French Society of Phoniatrics will be held at the Paris Faculty of Medicine, under the presidency of Professor Lemaitre, on October 21st, when Professor Portmann will read a paper on radiology and phonation.

The issue of the *Bulletin de l'Office International d'Hygiène Publique* for August is devoted to the incidence of ankylostomiasis in various countries, and a supplement for the same month deals with mental hygiene and the education of backward or abnormal children.

The *Manchester Guardian* announces that the board of management of the Manchester Royal Infirmary approved on September 28th a contract of £10,075 for the building of a new orthopaedic block, to be completed by February 1st, 1937. The total cost of building and equipping the premises will be £27,000. The new building is intended to accommodate the orthopaedic out-patient department, the daily fracture clinic, the physiotherapy department, and the school of massage and medical gymnastics.

Lord Hampden, presiding at the annual meeting of the Central Council of Recreative Physical Training, spoke of the need for larger funds to help the national movement for more efficient physical education. He said that unless the council could look forward to substantial financial support in the immediate future the crucial work on which it was engaged for the welfare of the whole nation would suffer. The meeting was held at the offices of the National Playing Fields Association, 71 Eccleston Square, S.W.1.

As a result of its recent appeal, the British Red Cross Society is forwarding a second contribution of £500 to the International Red Cross Committee at Geneva towards the relief of the sick and wounded of both combatant forces and of distressed civilian population in Spain.

A statue of the histologist Camilio Golgi, who died in 1926, was recently unveiled at Pavia.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin).

QUERIES AND ANSWERS

Sweating in the Course of Treatment with Thyroid

"LEVEL" writes: A female patient, aged 84, suffering from myxoedema, has been having 1/2-grain thyroid tablets daily for over three years; she complains of profuse sweats and much rheumatic pain in the lower limbs. Is the sweating due to the thyroid, and is such pain usual in myxoedema?

Gold Salt Injections

"C. H. B." asks for references to any articles comparing the effects of gold salts injected intravenously and gold salts injected intramuscularly. From my own experience (he writes) there is an immense difference, but it may be exceptional.

*** Drs. Hartfall and Garland, in "Further Observations on the Gold Treatment of Rheumatoid Arthritis" (*Lancet*, June 27th, 1936), state in their summary and conclusions: "There is no notable difference in the curative effects or toxicity between intravenous and intramuscular methods of administration."

Cramp in the Legs

"L. P. T." writes in reply to "W." (October 3rd, p. 698): I have recently treated a case of severe nocturnal cramp in the legs in an old lady of 72, who had suffered from it with increasing frequency for years, by the simple device of putting an upright board double the depth of the mattress in between the sheets at the foot of the bed, thus taking the main weight of the bedding off the feet without reducing the warmth. She has had no attacks at night for some months now.

Income Tax

Private Use of Car

"C. S." inquires: "What is the usual percentage deduction made in the case of an urban-rural practice as representing the private use of a car, and how is this affected if the practitioner has two cars?"

*** The basis should be the ratio of the private to the total mileage, but that is often a matter of guesswork. We may, however, say that 10 per cent. is not uncommon, though larger percentages are sometimes justifiable. Such a percentage usually assumes that when the car is used privately for a substantial period—for example, on holiday—running expenses are not charged to the professional account. That is sometimes a useful point in discussion with the inspector of taxes. The fact that two cars are kept would not affect the principle, but might indicate a higher ratio of private use.

"Unearned" Income—Allowances

"J." inquires what tax is payable by a married man over 65 years of age on a total income of £350 entirely from dividends.

*** The allowances due for 1936-7 are: "personal" £180, "age relief" (one-fifth of £350 =) £70, and tax is therefore payable on £350 − £250 = £100 at 1s. 7d. in the £—that is, £7 18s. 4d. It is assumed that either "J." or his wife was 65 years of age on April 5th, 1936. It may be advisable to point out that the method of computing the amount of tax to be returned by the Revenue Authorities as the difference between £7 18s. 4d. and the tax deducted from dividends may be misleading, because Dominion income tax relief, or the inclusion of pre-1936-7 income, may reduce the amount of tax actually deducted.

LETTERS, NOTES, ETC.

The Grenfell Calendar

All those who begin to search at this time of the year for a calendar which, while being also an engagement diary, will be an adornment to any room, will have cause once more to be grateful to the Grenfell Association of Great Britain and Ireland. The Grenfell Calendar for 1937 has already appeared, and is even more attractive than its predecessors. On each of the fifty-three pages is a reproduction of a photograph of life in Labrador, and a quotation from the writings of Sir Wilfred Grenfell. The calendar, which is modestly priced at 3s. 6d. (4s. post free), is obtainable from the offices of the Association, 66, Victoria Street, S.W.1, and is sold for the benefit of Sir Wilfred Grenfell's work in Labrador.

Medical Golf

The seventh autumn meeting of the Sussex Medical and Dental Golfing Society was held on the links of the Southdown Golf Club on September 25th, when thirty-four members competed. The captain's prize, presented by Dr. A. E. Kerr, was won by Mr. Scott Page. The afternoon 4-ball foursome against bogey resulted in the following tying at 3 down: Drs. McWhirter and Hosford, McAleenan, jun., and Devlin, Muir Smith and Densham.

A week-end meeting of the London Irish Medical Golfing Society was held at Littlestone on October 4th and 5th, with the following results. Cahill Trophy: S. C. Morrow (13) 71 + 71 = 142. Captain's Prize: S. C. Morrow 3 up (two rounds). President's Prize (scratch): J. A. Flaherty + 1 = 72. Veteran's Prize: J. F. O'Malley (10) 74. Canny Ryall Cup: J. F. Healy (3) 71. Lett Cup: M. J. Smyth and Lieut.-General Sir James Hartigan 1 up. O'Malley Cup: R. F. Jones (6) 1 up. Mannix Cup: J. Nunan (6) 301 (four rounds).

London School of Dietetics

Miss M. MARTIN LEAKE wishes it to be known that the London School of Dietetics, Ridgmount Street, W.C.1, has no connexion with the London College of Dietetics Ltd., mentioned in Lord Horder's disclaimer on page 656 of our issue of September 26th.

Corrigendum

Dr. N. S. FINZI asks us to correct an unfortunate misprint in the *Journal* of August 8th (page 303, column 2). In the brief report of his remarks at Oxford on *x*-ray therapy in deep-seated malignancy the third sentence should have begun "Bronchial carcinoma gave rise to metastases *very early*" (not very rarely, as printed); and Dr. Finzi supplemented this by saying that *all* his cases had had metastases.

The address of the University Appointments Board has now been changed from 46, Russell Square to "Appointments Board, University of London, W.C.1." The telephone numbers remain unchanged.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 56, 57, 58, 59, 60, 61, 64, and 65 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 62 and 63.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 203.